

**Thematic Evaluation**  
**"Analysis of the Outcome Generating**  
**Process of 5S-KAIZEN-TQM**  
**Approach in Hospitals"**  
**Final Report**

**July 2013**

**JAPAN INTERNATIONAL COOPERATION AGENCY**  
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## Preface

The state of health on the African continent continues to remain in a difficult situation today. The average life expectancy of people who live in Sub-Saharan Africa is 53 years of age, and some five million children lose their lives each year before they have the opportunity to mark their fifth birthday (2011 statistics, WHO). Amid such conditions, from the standpoint of delivering the health care services that are needed by people, there is a pressing need to strengthen the functions of health care institutions, such as hospitals. On the other hand, in Sub-Saharan Africa, there is a lack of various resources, such as human resources who are engaged in health care, as well as funds and goods, and practitioners of health care have been forced to face a hard battle under severe conditions. What should be done in order to improve the quality of hospital services in an environment in which there is a lack of resources? The “Program of TQM for Better Hospital Services”, launched in 2007, for which joint efforts have been made with health care practitioners in 15 African countries, can be described as a unique endeavor to find an answer to this difficult question, using the “5S-KAIZEN-TQM Approach”.

The “5S-KAIZEN-TQM Approach” is a method of quality control and organizational innovation that has its roots in the manufacturing industry in Japan, which is also aimed at improving the quality of hospital services, and has already produced many outcomes in various parts of Africa. In our research, we have analyzed projects that are initiated using this approach for the methods in which the logic for producing outcomes have been planned, from the activities through the outcomes and the project purposes, as well as on the types of logic that result when these approaches are actually implemented at hospitals and health care facilities. Through these considerations, we have sorted through data and offered proposals for the issues that are generally faced by hospitals, for which we believe the “5S-KAIZEN-TQM Approach” would be effective (such as medical accidents, hospital infection, and the management of pharmaceutical products and equipment), and we have put together logic models (which include the development of logic for project purposes, outcomes, and key activities, and accompanying indicators) that may be used by each health care facility for its own program.

Furthermore, as the analysis that we have conducted on this occasion focuses on the issues that are faced by hospitals and health centers on an individual basis, as well as their solutions, we have also limited our logic model proposals to those for the development of projects on individual facilities. Needless to say, when using the results from this analysis in the actual development of projects, it is essential that our efforts for strengthening health care facilities are understood in the context of “health care systems”. It would be our great joy to see the results of this research contributes to the efforts being made by those concerned, in Japan and beyond, for improving the functions of health care facilities in developing countries. I also hope that the logic models herewith presented continue to be enhanced through the knowledge and expertise of the people who are engaged in this field.

Finally, I would like to express my heartfelt gratitude to the people who have offered their cooperation and support for this research.

July 2013  
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## Target countries and projects



- 1 . Eritrea (AAKCP)
- 2 . Uganda (AAKCP,TC)
- 3 . Kenya (AAKCP)
- 4 . DR Congo (AAKCP,TC)
- 5 . Senegal (AAKCP,TC)
- 6 . Tanzania (AAKCP, TC)
- 7 . Nigeria (AAKCP,TC)
- 8 . Niger (AAKCP)
- 9 . Burkina Faso (AAKCP,TC)
- 1 0 . Burundi (AAKCP, TC)
- 1 1 . Benin (AAKCP)
- 1 2 . Madagascar (AAKCP)
- 1 3 . Malawi (AAKCP, sending experts)
- 1 4 . Mali (AAKCP)
- 1 5 . Morocco (AAKCP,TC, Third Country Training Program)

AAKCP : Asia-Africa  
Knowledge Co-creation  
Program

TC : Technical Cooperation

## Photos taken in the survey



1. Color-coded trash boxes  
(Mhinbili Hospital, Tanzania)



2. A vial container made by recycled polystyrene  
(Mhinbili Hospital, Tanzania)



3. A shelf for keeping patients' charts made by recycled timbers  
(Mbalizi Hospital, Tanzania)



4. A ballot box for voting patients' satisfaction  
(Kotiary Health Post, Senegal)



5. Classified money by 5S activity  
(Gaspard Camara Health Center, Senegal)



6. A patient information sheet put on the side of a patient's bed  
(Thies Hospital, Senegal)

## Table of abbreviations

AAKCP	Asia-Africa Knowledge Co-creation Program
AHRQ	Agency for Health Research and Quality
CQI	Continuous Quality Improvement
FHI	Family Health International
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IPC	Infection Prevention Control
JHPIEGO	Johns Hopkins Program for International Education in Gynecology and Obstetrics
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
KPO	Kaizen Promotion Office
MDGs	Millennium Development Goals
NDP	National Demonstration Project
NGO	Non-Governmental Organization
PARSS	Project for Reinforcement of Health System Management in Tambacounda and Kedougou
PBF	Performance-Based Finance
PDCA	Plan, Do, Check, Action
PDM	Project Design Matrix
PNDS	Plan national de développement sanitaire 2009-2018
QC	Quality Control
QI	Quality Improvement
QIT	Quality Improvement Team
TQM	Total Quality Management
USAID	United States Agency for International Development
WIT	Work Improvement Team



## **Executive summary**

### **1. Background**

The Japan International Cooperation Agency (JICA) has conducted the “Program of TQM for Better Hospital Services” since 2007 in 15 African countries and promoted enhanced hospital management and improved hospital service by adopting the “5S-KAIZEN-TQM Approach” in these 15 countries. In the “Program of TQM for Better Hospital Services”, various studies and reviews have been conducted and the program achieved various outcomes that include spontaneous and continuous efforts related to improved business operations in the hospital, improvement of hospital environment and management through KAIZEN activities implemented in each pilot hospital of the project.

However, sufficient analyses have not been conducted regarding the process through which outcomes emerge and also regarding bottlenecks when introducing the “5S-KAIZEN-TQM Approach” throughout the entire program, because it is difficult to compare hospitals surrounded by different environments in different countries. Especially, the summarization and analysis regarding the improvement in hospital work environment and the work flow that are essential as a process before the phase prior to the effect generating is manifested at the impact level is considered to be necessary in order to draw lessons and proposals that can contribute to improved projects in the future.

Furthermore, the following issues have been identified by those who conducted the program:

- (1) Cases in which the approaches have become the quasi-objectives, rather than serving as the tools for resolving the various healthcare issues,
- (2) Cases where the “improvement in the quality of hospital services”, which should be achieved by the project, have not been defined with tools such as indicators and thus remain vague,
- (3) Cases where activities have required time in 5S activity, with a focus on hospital facility improvement, and there was a delay in reaching the stage of KAIZEN, the improvement of work processes,
- (4) Cases where there are difficulties in implementing voluntary actions for those concerned at the hospitals in a continuous manner,
- (5) There are difficulties in expanding the approaches from a pilot hospital to other hospitals.

As these issues have been pointed out and identified in discussions held among parties related to JICA, there are needs for the collection and analysis of information that will contribute to resolving these issues.

### **2. Objectives of the survey**

With the above-mentioned background, this thematic survey conducts an analysis of the process of outcome generating and verification of bottlenecks and considerations when the “5S-KAIZEN-TQM Approach” is introduced in health facilities such as hospitals based on specific data on a series of projects (technical cooperation project, individual expert dispatch, preparatory survey, etc.) related to the “Program of TQM for Better Hospital Services”. Based on these analysis and verification results, this survey creates references that classify and organize logic models and indicators of the generated outcomes as well as considerations as a practical tool based on the “Proposed logic model adopting the 5S-KAIZEN-TQM Approach in

hospitals”. Those who are involved in health improvement endeavors, including JICA’s professionals in charge of health and medical projects can utilize such references when they are formulating, implementing, monitoring and evaluating a project by utilizing the “5S-KAIZEN-TQM Approach”. Specifically the following four points summarize the objectives of this survey.

- Objective 1: Verification on the project design of the target project regarding introduction of the “5S-KAIZEN-TQM Approach” into hospitals (including goals and outcomes of the project, logic development between major activities, and associated indicators)
- Objective 2: Analysis of hypotheses on the process of effect generating and bottleneck regarding introduction of the “5S-KAIZEN-TQM Approach” into hospitals
- Objective 3: Presenting draft project design (the project logic, the project purposes, outcomes, activities and related indicators) to better adopt 5S at public health and medical facilities by different health issues
- Objective 4: Analysis and summarization of points and consideration when introducing the “5S-KAIZEN-TQM Approach”

In this survey, the following four hypotheses were established, based on which the above-mentioned objectives of the survey were to be achieved through setting and verification of issues to be covered in the survey.

For verification, Hypotheses 1 and 2 shall be mainly focused. Hypotheses 3 and 4 shall be used for extraction through verification only when there are any points to consider in formulating and implementing new projects.

- Hypothesis 1: The main issues in individual hospitals and the process of solution for them may not be clearly reflected in the project design (project purposes, outcomes, and indicators, etc.).
- Hypothesis 2: There are factors that disturb development from 5S (environmental renovation in hospital) to KAIZEN (renovation in work processes, etc.).
- Hypothesis 3: Consistent involvement of all who are concerned with the hospital from the start of activity is associated with continuation of 5S-KAIZEN-TQM activities (insufficient involvement has an impact on continuation.).
- Hypothesis 4: When deploying the scenario, “From establishing 5S at pilot hospitals to disseminating all across the country by the Ministry of Health,” pilot hospitals suffer bottlenecks in verifying and ensuring input of the “5S-KAIZEN-TQM Approach”

### **3. Methods and result of the survey**

The survey was conducted by the following three methods.

- 1) Literature review
- 2) Interviewing experts
- 3) On-site survey

#### **1) Literature review**

An analysis was conducted on the project-related documents which is the equivalent of PDM or “log frame” related to a series of projects being implemented or having been implemented (technical cooperation project, individual expert dispatch, preparatory survey etc.) in the fifteen African countries related to the “Program of TQM for Better Hospital Services”. The logical development of effect generating related to the “5S-KAIZEN-TQM Approach” was verified. Thereby, the following four problems were extracted.

- ① The standpoint of hospital management: It falls under the higher concept of 5S activity in hospitals, and is not clearly reflected in project design and indicators.
- ② Indicators of output: The effect indicator regarding 5S activities often remain in output level.
- ③ Process of operational KAIZEN: The process of improvement from the improvement of “physical environments” to that of “operations” is not clearly incorporated in project design.
- ④ Overall goals and project purposes: Although indicators of impact levels such as “patient satisfaction” are included in overall goals, some inappropriateness is seen in part of the relationship with project purposes.

## 2) Interview with specialists

In the domestic interview survey conducted before on-site operation was started, we visited Iwata City Hospital that adopted 5S and was achieving a steady result, and interviewed those who were engaged in introducing the “5S-KAIZEN-TQM Approach” in the 15 African countries.

The following are the content confirmed in the interview.

- Positioning of the “5S-KAIZEN-TQM Approach” in health and medical projects
  - The “5S-KAIZEN-TQM Approach” is a method to improve management that is used for promoting reforms in awareness of staff and improving organizational capacity.
  - The “5S-KAIZEN-TQM Approach” is useful for enhancing motivation of medical staff and other workers. It does not have a direct impact on maternal mortality or relevant indicators.
- Points to promote and make the “5S-KAIZEN-TQM Approach” successful
  - Promotion and success of 5S heavily rely on the awareness and attitude of the management such as the head of hospital. However, since the leadership of the head alone is limited, organizational efforts such as establishing QIT team to support the head are necessary.
  - It is important for those who work in a health facility such as the said hospital to be aware of the current state and the issues of the facility.
- Problems seen when conducting the project etc.
  - Information such as data on hospital infections, accidents and closing account is not well managed in the developing nations in the African region, which makes it difficult to obtain the baseline (standard value) to monitor and verify the expressed quantitative effects and causes of the problems when conducting the project.
  - Human resource for health care is short both in terms of quality and quantity. The “5S-KAIZEN-TQM Approach” alone cannot achieve outcome and goals of the project.
- Scale of the hospital and the scope of introduction of the “5S-KAIZEN-TQM Approach”
  - Dissemination of the approach is difficult where the scale of the hospital is too big that supervision of QIT can not extend to the whole hospital. It is better to start within a small range where QIT and the head of hospital can provide sufficient supervision.
- Involvement of the supervising agencies (such as Ministry of Health) from the central government into the “5S-KAIZEN-TQM Approach”
  - The following are the roles to be played by the Ministry of Health:
    - ① Formulate and develop manuals and guidelines of the government policy and tools for dissemination of the “5S-KAIZEN-TQM Approach”

- ② Make an optimal allocation of human resources to the health and health facilities such as hospitals
- ③ Introduce the Performance-Based Finance (PBF: a framework to allocate budget according to the performance) to enhance “motivation” of hospitals to engage in the “5S-KAIZEN-TQM Approach”

### 3) On-site survey

For on-site survey,, out of the fifteen countries in total where the projects related to the “Program of TQM for Better Hospital Services” are implemented, such factors as the (1) relatively high volume input of cooperation by JICA; (2) successful result of the “5S-KAIZEN-TQM Approach” being actually introduced in health facilities such as hospitals, (3) verifiability at both levels of the hospital and public health institute center were considered and two countries, Tanzania and Senegal, were selected as survey subjects. The researchers visited and consulted the public health ministries and health welfare ministries of each country as well as public health institutes and health offices at state and county levels, and visited five health facilities in Tanzania, and three health facilities and three institutes and centers in the public health field in Senegal. The main result of the on-site survey is as follows:

- (1) Problems that are common in these hospitals and public health centers and posts:
  - ① Elimination of medical accidents
  - ② Prevention of hospital infection
  - ③ Solution to the lack of resources – i.e. labor, goods, money
  - ④ Improvement of the service quality
  - ⑤ Enhancement of organizational capacity
- (2) Factors Promoting 5S and KAIZEN in implementation were:
  - ① Strong leadership of top management
  - ② Installation of QIT and energetic activities
  - ③ Supervision by the Ministry of Health and Regional Medical Office
  - ④ Evaluation/ request of activities in the hospital by media and local residents boosted the motivation.
  - ⑤ Lack of knowledge and labor was mitigated by the input of Japan Overseas Cooperation Volunteers (JOCV.)
- (3) Factors that inhibit the implementation of 5S and KAIZEN were:
  - ① Resistance from staff who dislike changes in work content and work environment
  - ② Busy work schedule due to labor shortage did not allow employees to have time for the 5S and KAIZEN activities.
  - ③ Transfer and retirement of staff (Personnel of those who took the 5S training course did not settle in the same position.)
- (4) Main activities of Head of Hospital who plays the key role for successful introduction of the “5S-KAIZEN-TQM Approach” include:
  - ① Convince resistant power;
  - ② Explain the importance of the “5S-KAIZEN-TQM Approach” activity to hospital staff;
  - ③ The Head of Hospital proactively practicing 5S activities.

## 4. Verification of the four hypotheses

Based on the domestic survey and on-site survey, the hypotheses were verified within the scope of the “5S-KAIZEN-TQM Approach” in the project.

【 Hypothesis 1 : The main issues in individual hospitals and the process of solution for them may not be clearly reflected in the project design (project purposes, outcomes, and indicators, etc.) .】

Conclusion : Process (logic) of solution for such issues through the introduction of the “5S-KAIZEN-TQM Approach” at health facilities in question such as hospitals may not be clearly reflected in the project design. Furthermore, there is a partial leap in the steps of the effect in logic itself and the development of the logic for addressing each central issue (by issue types) is necessary.

【 Hypothesis 2 : There are factors that disturb development from 5S (environmental renovation in hospital) to KAIZEN (renovation in work processes, etc.) .】

Conclusion : Factors that disturb development lie in creation of educational method for introducing the approach, method for goal setting and indicator setting, as well as the environment conducive to gaining such indicators. In order to promote the development from 5S to KAIZEN, it is necessary to teach KAIZEN in a simple manner and make the relevant parties understand that the 5S is a “tool” for KAIZEN. Furthermore, it is important to set the goals and indicators at each level corresponding to the step levels of the logic of the effect generating and the development of the system of work environment conducive to gaining such indication is also necessary.

【 Hypothesis 3 : Consistent involvement of all who are concerned with the hospital from the start of activity is associated with continuation of 5S-KAIZEN-TQM activities (insufficient involvement has an impact on continuation.) .】

Conclusion : In most cases of the projects which became the subjects of the survey, the project did not involve all those concerned with the entire hospital which remained the same entity from the beginning of the activities. And in the majority of the cases a partial department was selected as a pilot, and the program was introduced there at first and transferred the successful case to other departments to enable continuity. Then this hypothesis is not necessarily appropriate.

【 Hypothesis 4 : When deploying the scenario, “From establishing 5S at pilot hospitals to disseminating all across the country by the Ministry of Health”, the lack of inspection of the results and of input resource for the “5S-KAIZEN-TQM Approach” at pilot hospitals are bottlenecks of the deployment.】

Conclusion : Generally, it was confirmed that it was with bottlenecks in nationwide development of the “5S-KAIZEN-TQM Approach”, that the lack of the result inspection and of input by supervising authorities at central government agencies such as the Ministry of Health to the pilot hospitals. In addition, Tanzanian Mbeya consultant hospital, and Kotiary health post of Senegal succeeded in introduction of the “5S-KAIZEN-TQM Approach”, got strong support for disseminating the approach all across the country from the Ministry of Health and the State Medical Affairs Bureau, and Mbeya consultant hospital expanded an action in facilities of itself using the support and succeed in expansion to outside facilities.

## **5. Draft logic model and indicators of the “5S-KAIZEN-TQM Approach” in hospitals**

### (1) Basic ideas in developing a logic model

In Chapter 4, a logic model (draft) was prepared by using “Continuous provision of public medical service” as an overall goal when introducing the “5S-KAIZEN-TQM Approach” in public health facilities in African countries. We made a proposal that include tasks that can be solved in the medical field and their measurable indicators from the stand point of management improvement, as well as points to note in introducing and conducting the approach while comparing with the logic model in the manufacturing floor.

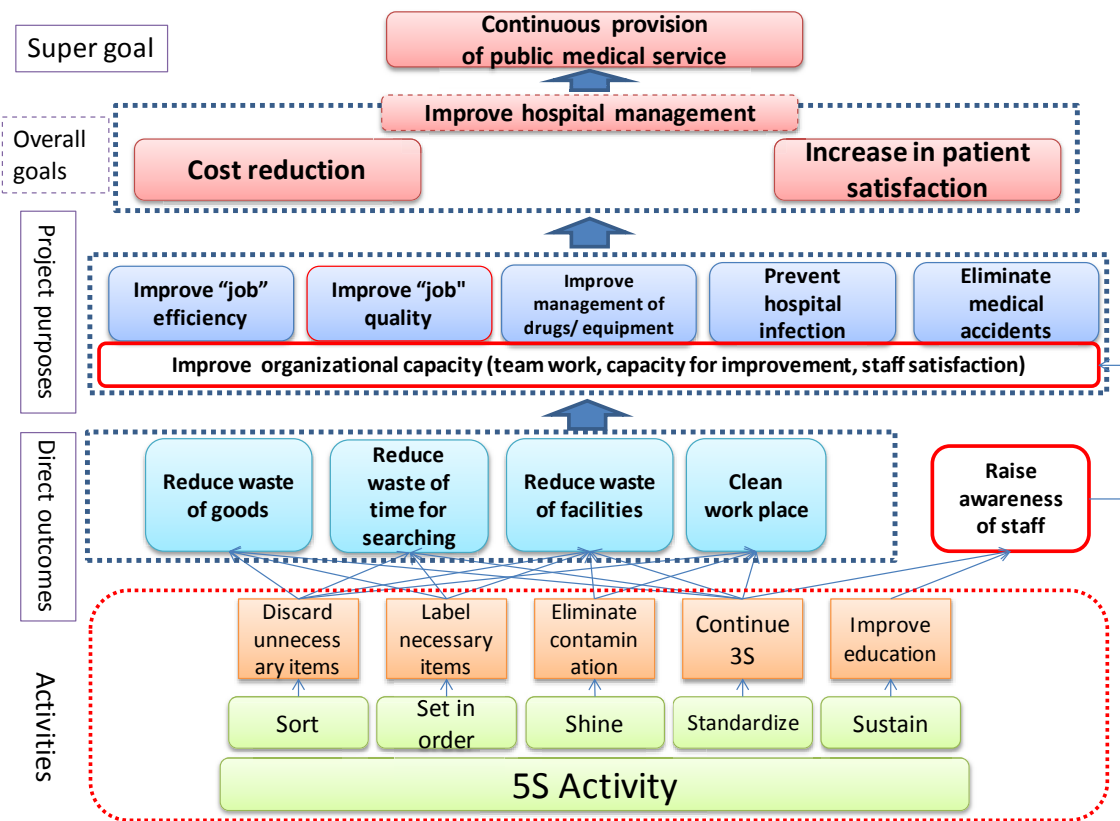
(2) The ideas about logic model of the “5S-KAIZEN-TQM Approach” in hospitals

The biggest difference between the manufacturing industry and the public health and medical industry such as hospitals lie in the fact that in the manufacturing industry, it is expected that the same product will continue to be produced at the same quality but a specialized response according to the condition is required in the health and medical industry because the conditions of the patients will vary from one case to another. However, we can expect the similar and significant effect as in the manufacturing industry with the “5S-KAIZEN-TQM Approach” in the work associated with individual medical action as well as improved resource and human management even if individual variances exist among patients.

The super goals of the logic model of 5S-KAZEN-TQM in the private hospitals in Japan and the United States are “continuous development of the hospital” and the overall goals are “increased profit,” “increased sales” and “improved patient satisfaction.” However, almost all the hospitals in the African countries in question are national or state run and almost all the expenses are paid for with the national budget and contributions from donors. Taking into such facts into account, the overall goals are set to be the “continuous provision of public health service” within the limited budget. The overall goal of “increased profit” is replaced by the “cost reduction” per patient with a goal of the largest number of patients receiving the service. As for the “increased sales,” we take into consideration the fact that increased number of patients does not immediately lead to the increased sales in light of the current conditions in Africa, we have decided to remove that from the goal. We used the “improved patient satisfaction” as is due to its universality.

The project target in African hospitals is to select the tasks in which the “5S-KAIZEN-TQM Approach” will achieve effectiveness out of the tasks the hospitals face as identified in the on-site surveys, and set six tasks: (1) elimination of medical accidents, (2) prevention of hospital infection, (3) improved management of drugs and equipment, (4) improved “job” efficiency, (5) improved “job” quality and (6) improved organizational capacity. Here the “job” refers to all the work performed in a health facility. For example, it is a large concept including not only the medical action but also hospitality to the patient, office work, cleaning operation and KAIZEN activities.

The following figure (Figure 1) was prepared based on the above-mentioned ideas to show the overall picture of the proposed logic model of the “5S-KAIZEN-TQM Approach” in African hospitals.

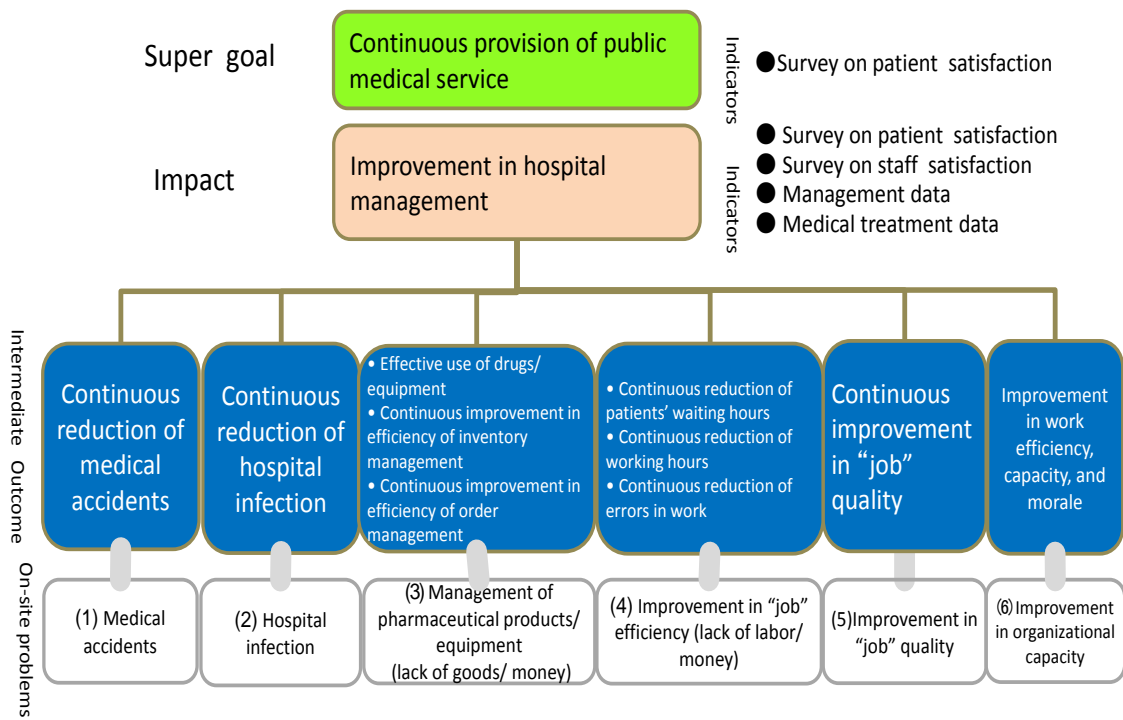


**Figure 1 Proposed logic model of the “5S-KAIZEN-TQM Approach” in African hospitals**

(3) Proposed logic model and draft indicators

Based on the above-mentioned ideas, Figure 2 shows the proposed logic model per problem type of the six problems that the African hospitals encounter that adopt the “5S-KAIZEN-TQM Approach”

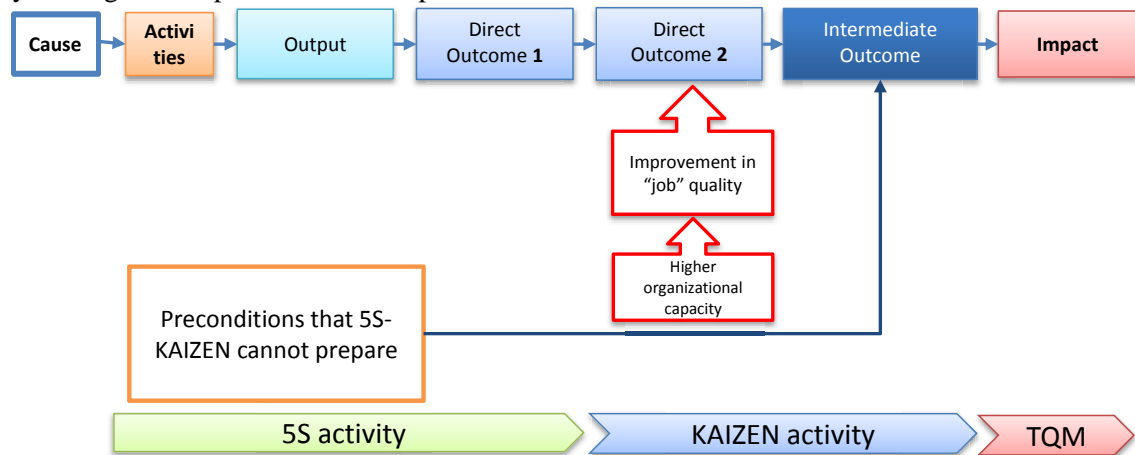
For example, the logic provides that the continuous decrease in (1) “medical accidents” and (2) “hospital infection” will lead to the “improved hospital management” through improved patient satisfaction and ultimately secure the “continued provision of public health service.” There is another logic that the improvement in the (4) “management of drug and equipment” and (5) “job efficiency” will lead “improved hospital management” through “decreased cost” and the money saving allows provision of public health service to as many patients as possible and secure the “continued provision of public health service” which is meant to prevent the financial collapse of the public health service. There is a slight difference in logic between the (5) “job” quality and (6) “organizational capacity” versus the other four tasks.



**Figure 2 Logic model per six issue types in “5S-KAIZEN-TQM Approach” in African hospitals**

Figure 3 shows the basic structure of the proposed logic models from tasks (1) to (4). Further, (5) “job” quality and (6) organizational capacity are the preconditions of the direct outcome 2 in the logic of other tasks (1) to (4). That means, the 5S level activities alone can achieve effectiveness up to direct outcome 1, but in order for the effectiveness for direct outcome 2 above, the activities at KAIZEN levels are necessary. The precondition for such KAIZEN-level activities is the (5) “job” quality and (6) “organizational capacity.”

In particular, the content of improving “job” quality are mostly development of operation standard, which are activities at the KAIZEN level, and the continuous improvement activities by finding out the problems in the operation standard.



**Figure 3 Basic structure of logic model**



The content of improved “organizational capacity” consists of capacity building efforts to execute a series of activities by improvement planning (Plan), doing it (Do), confirming the result (Check) and deciding the next activities (Action) as part of group activities through spontaneous finding of the tasks. Therefore, it follows from the logic that in order for the other four tasks to continuously improve, these two activity capacities will be necessary as precondition.

In selecting the draft indicators to measure the output, outcome and impact of the logic model, we refer to the following:

- (1) Items on the checklist and indicators used in the “Program of TQM for Better Hospital Services”;
- (2) Indicators set for measuring the effectiveness by other donors in Africa;
- (3) Indicators provided by the Welfare and Medical Service Agency and as used in hospital management diagnosis in Japan
- (4) Indicators used in the 5S projects in Japanese hospitals (Nerima General Hospital, Takeda Hospital, Iwata City General Hospital, Musashino Red Cross Hospital).
- (5) Indicators used in American National Demonstration Project (NDP) on TQM for health;
- (6) Indicators used in KAIZEN activities in the Virginia Mason University in the United States.

Based on the above, the following points were selected as standard.

- (1) Indicators which were considered relatively easy to gather in Africa (including, however, the data that need new infrastructure development for obtaining indicators);
- (2) Data that can be continuously gathered;
- (3) Data which require relatively little cost and work in gathering.

However, there are many indicators for which no data was obtained in the current situation, and therefore, for the future project planning, we need to establish indicators and at the same time consider development of environment including infrastructure in order to obtain the indicator.

These six types of logic models and examples of indicators are proposed as a “reference and a practical tool”. Those who are concerned with health improvement initiatives in developing countries including JICA’s officials in charge of health projects are suggested to refer to and to utilize them after recognizing the types of problems in the hospitals. This “reference and a practical tool” includes logic models, indicators, and points for consideration for outcomes in forming, implementing, monitoring and evaluating projects by utilizing the “5S-KAIZEN-TQM Approach”.

# Chapter 1 Background / objectives of this survey

## 1.1 Background of this survey

### 1.1.1 Situations that surround health facilities in African countries

Regarding the situation of health facilities in African countries, the following reports mention shortage of resources and lack of financial resources for medical services.

In order to achieve the Millennium Development Goals (MDGs) compiled in response to the Millennium Declaration adopted by the UN Millennium Summit in 2000, the entire organization for development aid all across the world provided considerable amount of fund and support programs. On the other hand, MDGs related to health care are not sufficiently achieved yet. Especially, health care indicators are still facing tough situation in African countries. Since Japan demonstrated initiative in measures to prevent infections in the Kyushu/ Okinawa Summit held in 2000, an increasing amount of funds has been invested in measures against infections in the world. However, aid money has not been sufficiently given to healthcare and health facilities in developing nations where degradation is noted in facilities and equipment. Above all, African countries suffer extreme shortage of healthcare and health facilities<sup>1</sup>.

Healthcare and health facilities in developing nations, especially African countries, face shortage of resources that include doctors, nurses and other medical staff, medical equipment and materials, drugs, and budget to run facilities. They also suffer lack of information such as patient records, clinical indicators, and epidemiological data. In those countries, proper healthcare and medical services cannot be provided because of the situation mentioned above as well as deteriorated morale in medical staff, and lack of knowledge/ recognition on safety and right of patients<sup>2</sup>.

### 1.1.2 Background of this survey

The Japan International Cooperation Agency (JICA) has conducted the “Program of TQM for Better Hospital Services” since 2007 in 15 African countries as part of the “Africa-Asia Knowledge Co-Creation Program” and tried to improve the hospital management and the resulting hospital service by adopting the “5S-KAIZEN-TQM Approach” The “Program of TQM for Better Hospital Services” has conducted various surveys and review and numerous outcomes have been confirmed such as spontaneous and continuous efforts of operational improvement within the hospital as well as improved hospital management and improved hospital’s environment through KAIZEN activities implemented in the pilot hospitals of the project.

However, sufficient analyses have not been conducted regarding the process of outcomes emerge and also regarding bottlenecks when introducing the “5S-KAIZEN-TQM Approach” in the entire program, because it is difficult to compare hospitals surrounded by different environments in different countries. Especially, improvement conducted in office environments and the work flow stage, which happens before impact is made in hospitals, should be summarized and analyzed to draw lessons that can contribute to projects in the future.

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<sup>1</sup> Review report on “Preparatory survey on the program of quality improvement of health services by 5S-KAIZEN-TQM” JICA, June, 2012

<sup>2</sup> Final report on the “Preparatory survey on the program of quality improvement of health services by 5S-KAIZEN-TQM” JICA, March, 2011

Furthermore, as the issues that are faced in the implementation of the program, the following points have been identified in discussions held among parties related to JICA:

- (1) Cases in which the approaches have become the quasi-objectives, rather than serving as the tools for resolving the various healthcare issues,
- (2) Cases where the “improvement in the quality of hospital services”, which should be achieved by the project, have not been defined with tools such as indicators and thus remain vague,
- (3) Cases where activities have become delayed in 5S activity, with a focus on hospital facility improvement, and time is required in reaching the stage of KAIZEN as well as the improvement of work processes.
- (4) Cases where difficulties are being encountered in expanding the approaches from pilot hospitals to other hospitals

Thus, there are needs for the collection of information that will contribute to resolving these matters, and for conducting analysis.

## 1.2 Objectives of this survey

With the above-mentioned background, this thematic evaluation will analyze the outcomes generating process and verification of bottleneck and considerations by introducing the “5S-KAIZEN TQM Approach” in health facilities such as hospitals based on specific data of a series of projects (such as technical cooperation project, dispatch of individual experts, preparatory survey) in connection with the “Program of TQM for Better Hospital Services”. Based on these analysis and the result of the verification, the project personnel such as the JICA official in charge of public health and medical projects creates reference as a practical tool to be referred to when formulating, implementing, monitoring and evaluating the project by utilizing the “5S-KAIZEN-TQM Approach”, with “Proposed logic model adopting the “5S-KAIZEN-TQM Approach” in hospitals” as the foundation that organizes the logic model and indicator of generated outcomes as well as considerations organized by problem types experienced by the hospitals.

Based on the above, the following four objectives are selected for this survey.

- Objective 1: Verification on the project design of the target project regarding introduction of the “5S-KAIZEN-TQM Approach” into hospitals (including goals and outcomes of the project, logic development between major activities, and associated indicators)
- Objective 2: Analysis of hypotheses on the process of effect generating and bottleneck regarding introduction of the “5S-KAIZEN-TQM Approach” into hospitals
- Objective 3: Presenting draft project design (the project logic, the project purposes, outcomes, activities and related indicators) to better adopt 5S at public health and medical facilities by different health issues
- Objective 4: Analysis and summarization of points and consideration when introducing “5S-KAIZEN-TQM Approach”

In this survey, the following four hypotheses are selected. Survey items were to be selected based on the hypotheses. The above-mentioned objectives of the survey should be achieved through setting the items on the survey and conducting verification. For verification, Hypotheses 1 and 2 shall be mainly focused. Hypotheses 3 and 4 shall be used for extraction through verification only when there are any points to consider in formulating and implementing new projects.

- Hypothesis 1: The main issues in individual hospitals and the process of solution for them may not be clearly reflected in the project design (project purposes, outcomes, and indicators, etc.).
- Hypothesis 2: There are factors that disturb development from 5S (environmental renovation

in hospital) to KAIZEN (renovation in work processes, etc.) .

Hypothesis 3: Consistent involvement of all who are concerned in hospital from the start of activity is associated with continuation of 5S-KAIZEN-TQM activities (insufficient involvement has an impact on continuation.) .

Hypothesis 4: When deploying the scenario, “From establishing 5S pilot hospitals to disseminating all across the country by the Ministry of Health”, the lack of inspection of the results and of input resource for the “5S-KAIZEN-TQM Approach” at pilot hospitals are bottlenecks of the deployment.

### 1.3 Target countries and target projects of this survey

This survey is to be conducted in 15 African countries: Eritrea, Uganda, Kenya, the Democratic Republic of the Congo, Senegal, Tanzania, Nigeria, Niger, Burkina Faso, Burundi, Benin, Madagascar, Malawi, Mali, and Morocco. However, an on-site survey was conducted in two countries –i.e. Tanzania and Senegal – among the 15 countries. Tanzania has achieved the KAIZEN-level introduction of the approach in some of its hospitals. Senegal is the only country where the “5S-KAIZEN TQM Approach” is introduced in public health institutions other than hospitals.

The survey covered the following 11 projects under the “Program of TQM for Better Hospital Services” being conducted in the countries subject to the survey.

**Table 1 Surveyed projects**

Name, area, and period of Project	Outline of Project
a. Asia/ Africa Knowledge Co-creation Program, “Program of TQM for Better Hospital Services” (Preparatory Survey / Region focused training, 2007~2013)	The “5S-KAIZEN-TQM Approach” was introduced in the following eight countries to improve hospital management: Eritrea, Kenya, Madagascar, Malawi, Nigeria, Senegal, Tanzania, and Uganda.
b. Asia/ Africa Knowledge Co-creation Program, “Program of TQM for Better Hospital Services” (Preparatory Survey / Region focused training, 2009~2013)	The program above was conducted in the second group consisting of the following seven countries: Benin, Burkina Faso, Burundi, Democratic Republic of the Congo, Mali, Morocco, and Niger.
c. Tanzania, “Strengthening Development for Human Resource for Health” (technical cooperation project, 2010~2014)	The project aims to formulate a plan to develop healthcare human resource at central, state, and district level, and to improve education/ bringing up/ training of healthcare human resource that can provide healthcare service with high quality.
d. Nigeria, “The Project for Improving Maternal, New Born and Child Health in the Lagos State” (technical cooperation project, 2010~2014)	The project aims to realize maternal healthcare service with high quality in areas subject to the project.
e. Burundi, “The Project for Strengthening Capacities of Prince Régent Charles Hospital and Public Health Centers in Bujumbura City for Improvement of Mother and Child Health” (technical cooperation project, 2009~2012)	The project aims to introduce patient oriented care of expected mothers and new born babies under better management in target healthcare facilities.
f. Senegal, “Project for Reinforcement	The project aims to enhance management capacity

of Health System Management in Tambacounda and Kedougou” ( technical cooperation project, 2011 ~2014)	focusing on outcome at the Medical Bureau and Health Post in those regions.
g. Uganda, “Project on Improvement of Health Services through Health Infrastructure Management” (technical cooperation project , 2011 ~2014)	The project aims to improve provision of healthcare service by effective and efficient utilization of existing healthcare infrastructure.
h. The Democratic Republic of the Congo, “Technical Advisor to the Secretary General of the Ministry of Public Health” (individual experts, 2008~13)	The project aims to enhance the capacity of agencies related to healthcare human resources to implement the national healthcare human resource development plan.
i. Morocco, “Adviser of Continuous Maternal and Child Health Care” ( individual experts, 2010~2013)	The project aims to ensure appropriate planning of measures in the field of Maternal and Child Health Care conducted by the Ministry of Health, conduct the measures effectively, and improve the quality.
j. Morocco, “Maternal and Child Health Care Phase 2” (Third Country Training Program, 2010 ~ 2013)	The project aims to teach expertise regarding Maternal and Child Health Care, improve and disseminate the technique and management capacity.
k. Malawi, “Expert on 5S-KAIZEN-TQM for Hospital Management” (individual experts, 2011~2013)	The project aims to enhance the quality of healthcare service provided by healthcare facilities by conducting 5S-KAIZEN-TQM.

## **Chapter 2 Implementation of survey and result of analyses**

### **2.1 Method of survey**

In order to achieve the four objectives of this survey, literature review, interview survey and on-site survey were conducted. Caution is necessary because the on-site survey was limited to two countries while fifteen countries were the subject of the survey. The remaining countries had the survey with relatively limited amount of information because the analysis was centered on the literature review.

Furthermore, this survey intends to verify the logic model in health facilities such as hospitals and public health institutions to seek solutions for problems, which arose out of the “5S-KAIZEN-TQM Approach” and experienced in such facilities but does not subject the log frame, which will serve as the entire design of individual projects for review and verification. Through such survey, we considered how the “5S-KAIZEN-TQM Approach” is adopted in projects in health and medical field and what kind of lessons and proposals can be deduced in such adoption as well as how to more effectively introduce the Approach.

### **2.2 Domestic survey**

#### **2.2.1 Literature review**

Literature review was conducted mainly on books and theses on introduction of the “5S-KAIZEN-TQM Approach” in health sectors in the world and on PDM, project plans, and reports of the 11 projects under the “Program of TQM for Better Hospital Services” being conducted in the 15 countries.

The first goal of conducting the literature review is to assess the method, background of introduction, characteristics of the activity, and outcome indicators regarding improvement of the quality of care in Japan, the USA and other regions, and to clarify lessons and tasks revealed when the “5S-KAIZEN-TQM Approach” is conducted in the 15 African countries.

The second goal is to collect information necessary for formulating a proposed logic model by reviewing documents related to the project. The necessary information includes logic of outcome generating which consists of the project purposes, outcome, main activities, status of generated outcome by the introduction of the Approach and evaluation indicators in the project being conducted in the 15 African countries. This also includes points and consideration for introduction of the “5S-KAIZEN-TQM Approach”

Literatures to be reviewed are classified in the following four groups.

- A. Literature, theses, and reports on 5S, KAIZEN, and TQM in the field of health care and medical service
- B. Literature on the tendency of improvement of quality and examples in the field of health care and medical service in Japan, the USA and other countries
- C. Materials related to a series of projects related to “Program of TQM for Better Hospital Services” in the 15 countries
- D. Other (literature on 5S, KAIZEN, and TQM in the field of manufacturing etc.)

These materials were provided by JICA, and were obtained by references to literature and through the internet as well as based on advice from experts. The following is a list of major

literature reviewed in this survey and their summary of information extracted from the literature according to the classification.

**Table 2 Reviewed materials**

Literature number	Literature	Summary of the content
A-1	Tomoko Kawakami, "Theoretical significance of introduction of Toyota Production method in the field of medical service," Collection of theses, Faculty of Commerce, Kansai University, Vol. 56, No. 3, December 2011	Hospital management had been given a relatively stable environment in the USA, but was forced a dramatic change due to the regulatory reform of Medicare and the rise of managed care, where the concept of cost and efficiency was raised in hospital management. (page 57)
A-2	"A study on enhancing an organization by the Method of Total Quality Management (TQM) in the sector of healthcare and medicine," JICA, 2006	"The Agency for Healthcare Research and Quality measures the quality by using 179 indicators at state and national levels and publishes the result every year. Furthermore, in order to measure the method of payment for medical practice based on the quality of medical service (Pay for Performance), the American Medical Association has selected 100 clinical indicators and conducted other activities." (page 11) "In Japan, quality of medical service was suddenly focused on by citizens in 1999 when a wrong patient was treated by accident at Yokohama City University Hospital." (page 12)
A-3	"General Measures to Promote Medical Safety," Ministry of Health, Labor and Welfare (2005)	"It is necessary to improve individual quality of "staff," "goods," "organization," and "software" in medical service."
A-4	"Simple management diagnosis," Welfare And Medical Service Agency	-The Agency started management diagnosis service for health facilities in 1985 under the concept, "Even socially significant businesses of social welfare and medical service cannot survive without sound business management." -The Agency prepares a management diagnostic tool for medical corporation, and provides it on webpage. The tool uses 25 indicators in 5 items – functionality, cost appropriateness, productivity, stability, and profitability.
A-5	"5S in medical sitting to prevent errors and accidents," JIPM Solution, 2011	Higher concept of 5S Activity, outcome, condition for expressing outcome, process, bottlenecks, measures to overcome bottlenecks, and measurement indicators at Takeda General Hospital
A-6	Seiichi Iesato, "A discussion on introduction of TQM in hospital management," Mita Business Review, Vol. 49, No. 5, December, 2006	Higher concept, outcome, condition for expressing outcome, bottlenecks, and measures to overcome bottlenecks at Nerima Hospital
A-7	Toshihiko Hasegawa, Wimal Karandagoda "Change Management For Hospitals" 2011	Higher concept, outcome, condition for expressing outcome, bottlenecks, measures to overcome bottlenecks, and measurement indicators in 5S Activity

B-1	Donald M. Berwick “Curing Health Care” 1990 D.M. Berwick “Curing Health Care - A Challenge for New Medical System,” Nakayama Shoten Co., Ltd., 2002	“Non-profit organizations need special management for survival since medical institutions have become profit-making businesses.” “A project was conducted to verify TQM in medical service at 21 hospitals where TQM was introduced (NDP : National Demonstration Project on TQM for health)” -Higher concept, outcome, condition for expressing outcome, process, bottlenecks, measures to overcome bottlenecks, and measurement indicators regarding improvement of the quality of care at the U.S. NDP
B-2	Charles Kenney “Transforming Health Care: Virginia Mason Medical Center's Pursuit of the Perfect Patient Experience” Productivity Press Taylor & Francis Group, 2011	It introduces the process of introduction of Toyota lean management method into Virginia Mason Medical Center in the U.S. to improve hospital management and quality of medical service.
B-3	“5S Activity at Iwata City Hospital- Efforts toward 5S Activity by all staff,” Iwata City Hospital, 2012	Higher concept, outcome, condition for expressing outcome, bottlenecks, measures to overcome bottlenecks, and measurement indicators in 5S Activity
B-4	Shozo Miyake, et al., “Endless Challenge for Medical Safety,” Elsevier Japan KK., 2005	Higher concept and process in the quality improvement activity at the Japanese Red Cross Musashino Hospital
B-5	“Nimnath Withanachch, Wimal Karandagoda and Yujiro Handa “A performance improvement program at a public hospital in Sri Lanka: an introduction”	Higher concept, outcome, condition for expressing outcome, bottlenecks, measures to overcome bottlenecks, and measurement indicators in 5S Activity at the Castle Street Maternity Hospital
C-1	Review report on “Preparatory survey on the program of quality improvement of health services by 5S-KAIZEN-TQM”, JICA, June, 2012	“There is overwhelmingly a small number of healthcare and health facilities in Africa” (Summary page i )
C-2	Final report on the “Preparatory survey on the program of quality improvement of health services by 5S-KAIZEN-TQM” JICA, March, 2011	“Healthcare and health facilities in developing nations, especially African countries, face shortage of resources that include doctors, nurses and other medical staff, medical equipment and materials, drugs, and budget to run facilities. They also suffer lack of information such as patient records, clinical indicators, and epidemiological data. In those countries, proper healthcare and medical services cannot be provided because of the situation mentioned above as well as deteriorated morale in medical staff, and lack of knowledge/ recognition on safety and right of patients.”(Summary page i )
D-1	Yukio Kakiuchi, “KZ Method for factory improvement,” Japan management Consultants Association, 2008	The author suggests as a method to promote improvement activities in Japanese manufacturers, “to excavate the problem by focusing on a limited area of work site, instead of the entire factory.”



### 2.2.1.1 Trends of improvement of the quality of care in Japan, the USA and Sri Lanka

#### (1) Trend in Japan

In Japan, quality of medical service was suddenly focused by citizens in 1999 when a wrong patient was treated by accident at Yokohama City University Hospital. Thereafter, subsequently occurring medical accidents harmed the trust of medical service among citizens. Prevention of medical accidents became one of the most significant tasks in the medical world. During this period, national interest in the quality of healthcare and medical service increased. As a consequence, evaluation on quality of health facilities was published one after another. Academic circles started projects for improvement by collecting cases of surgeries to measure the quality of medical service. Regarding government policies, the General Measures to Promote Medical Safety formulated in 2002 by the Ministry of Health, Labor and Welfare was revised in 2005, highlighting the necessity to improve individual quality of “staff”, “goods”, “organization” and “software” in medical service.” The revision also introduced safety improving systems by adopting the “method of product quality management used by manufacturers,” and “collection/ analysis of close calls and utilization of the result” which is generally exercised by manufacturers.

Along with this move, from mid 2000s, Takeda General Hospital<sup>3</sup>, Iwata City Hospital<sup>4</sup>, and Nerima Hospital<sup>5</sup> voluntarily began to introduce 5S, KAIZEN, and TQM activities which were started by Japanese manufacturers as a method to improve hospital management.

The Welfare and Medical Service Agency started management diagnosis service for medical facilities in 1985 under the concept, “Even socially significant businesses of social welfare and medical service cannot survive without sound business management.” The Agency conducted a total of 575 management diagnoses in 2011. In addition, the Agency prepares a management diagnostic tool for medical corporations, and provides it on webpage<sup>6</sup>. The tool uses 25 indicators in 5 items – functionality, cost appropriateness, productivity, stability, and profitability, which are similar to management indicators for manufacturers. The breakdown of these indicators include items related to hospital management such as ratio of labor cost, ratio of break-even point, labor productivity, annual medical profit per hospital bed etc.

#### **Column 1. The case of Iwata City Hospital**

In 2007, the entire hospital started 5S activity. The hospital aims to achieve sound hospital management and improve medical safety by improving work environment and work procedures in the hospital, and reducing wastefulness and errors in work. One of the outcomes is that the hospital reduced medical material inventory worth of 8 million yen by conducting 5S activity. The next goal is to continue an independent 5S activity without relying on external experts. The 5S promotion headquarters (management conference) and 5S promotion committee (managers from divisions) established in the hospital function as key to organizational 5S activity.

3. “A study on enhancing an organization by the Method of Total Quality Management (TQM) in the sector of healthcare and medicine,” JICA, 2006

4 “5S in medical sitting to prevent errors and accidents,” JIPM Solution, 2011

5 “5S Activity at Iwata City Hospital- Efforts toward 5S Activity by all staff,” Iwata City Hospital, 2012

6 “A discussion on introduction of TQM in hospital management,” Mita Business Review, Vol. 49, No. 5, December, 2006

7 <http://hp.wam.go.jp/guide/keiei/management/consultation/tabid/134/Default.aspx>

## (2) Trend in the United States

It is pointed out that hospital management had been given a relatively stable environment in the USA, but was forced a dramatic change due to the regulatory reform of Medicare<sup>7</sup> and the rise of managed care<sup>8</sup>, where the concept of cost and efficiency was raised in hospital management<sup>9</sup>. “CURING HEALTH CARE”<sup>10</sup> calls this change “medical service turning into profit-making business,” and this book mentions that non-profit organizations need special management for survival because of this change.

From 2003, the Agency for Health Research and Quality (AHRQ) measures the quality of a medical service by using 179 indicators at state and national levels and publishes the result every year. Furthermore, in order to measure the method of payment for medical practice based on the quality of medical service (Pay for Performance), the American Medical Association has selected 100 clinical indicators (A study on enhancing an organization by the Method of Total Quality Management (TQM) in the sector of healthcare and medicine). Since 1997, NDP to introduce TQM was conducted at 21 hospitals (“CURING HEALTH CARE”).

Hearing about a local manufacturer who adopted the Toyota Production Method and made a great achievement in management improvement, Virginia Mason Medical Center facing bankruptcy began considering of introducing the Method<sup>11</sup>. Thereafter in 2002, the Center participated in a two-week course held at Toyota in Japan, and started full-fledged activity. Now the Center has become a leading hospital that boasts high quality of care and sound management in the USA.

## (3) Trend in Sri Lanka

Aiming at dramatic reduction of hospital infection rate, the head of the Castle Street Maternity Hospital learned at that time the Japanese style management which had been introduced to local companies from Japan, and introduced it as a method to improve work environment at the hospital. At first, the fund for activity was not provided by the Ministry of Health. The hospital collected sponsors from commercial organizations to start the activity, and made a great success<sup>12</sup>.

Table 1 summarizes the comparison and characteristics extracted from the comparison between Japan, the USA, and Sri Lanka regarding the details of improvement activities in healthcare and quality of care according to the following seven items: 1) higher concept, 2) outcome of activity, 3) condition for expressing outcome, 4) process of activity, 5) bottlenecks in activity, 6) measures to overcome bottlenecks, 7) indicators for evaluation.

### 1) Overall concept

Higher concept refers to the desirable outcome to be ultimately achieved by the organization through activities. In Japan, Iwata City Hospital, Takeda General Hospital, Japanese Red Cross Musashino Hospital<sup>13</sup>, and Nerima Hospital started 5S activity in order to improve management

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<sup>8</sup> Public medical insurance applied to the elderly aged 65 years and older

<sup>9</sup> Medical insurance system aiming to reduce medical expenses by using management medical method

<sup>10</sup> Tomoko Kawakami, “Theoretical significance of introduction of Toyota Production method in the field of medical service,” Collection of theses, Faculty of Commerce, Kansai University, Vol. 56, No. 3, December 2011

<sup>11</sup> D.M. Berwick “Curing Health Care - A Challenge for New Medical System,” Nakayama Shoten Co., Ltd., 2002

<sup>12</sup> Charles Kenney “Transforming Health Care: Virginia Mason Medical Center's Pursuit of the Perfect Patient Experience” Productivity Press Taylor & Francis Group 2011

<sup>13</sup> Nimnath Withanachch, Wimal Karandagoda and Yujiro Handa “A performance improvement program at a public hospital in Sri Lanka: an introduction”

<sup>14</sup> “Endless Challenge for Medical Safety,” Elsevier Japan KK., 2005

such as resolution of deficit and reduction of wastefulness. In the case of American NDP, it also started 5S activity in order to improve management as hospitals were requested to reduce cost and improve efficiency in response to rising medical cost. Accordingly, the higher concept in projects introducing the “5S-KAIZEN-TQM Approach” in hospitals can be said to be the “improvement of hospital management” in Japan and the USA. However, the activity intends not just to reduce cost and increase profit, but widely involves the following purposes: reduce extra settlement money by eradicating medical accidents and reducing hospital infections; increase the number of patients by improving service for patients through improved work efficiency.

In Sri Lanka, the Castle Street Maternity Hospital is a national hospital, and expected to provide medical service with better quality for as many patients as possible. Thus, it is better to adopt “reduction of hospital infections,” which has higher priority for now, as the higher concept rather than “improvement of hospital management.”

#### 2) Outcome of activity

Reflecting on the difference in higher concepts, while cases in Japan and the USA reported outcomes in management efficiency such as cost reduction, cases in Sri Lanka reported reduced infection rate as a quantitative outcome of activity. As a direct outcome of the activity, improved work environment, change in awareness of staff, and improved communication among divisions and job types are commonly reported in Japan, the USA, and Sri Lanka.

#### 3) Condition for expressing outcome

All three countries mention, as a condition, a team consisting of all staff or staff from different job categories including doctors. These countries also suggest conducting appropriate training at an early introductory stage to teach the concept of the activity and basic tools. It is characteristic for the U.S. that total quality management (TQM) is clearly recommended. In Japan, Nerima Hospital demonstrated its characteristic by pointing out leadership of the hospital head. In other hospitals, the head of hospital demonstrated strong leadership to promote the activity. Thus, leadership seems important as a condition for expressing outcome. On the other hand, all four hospitals in Japan consider activities participated in by all staff from the bottom up. Organizational top down method alone causes heavy pressure on the person in charge, resulting in stagnancy in the activity.

#### 4) Process of activity

Hospitals in the three countries did not have any involvement of the supervising ministries and agencies of the central government such as the Ministry of Health to start the activity. The head of hospitals recognized problems and voluntarily started the activity to solve the problems. This approach was commonly seen in the three countries. The cases in the United States and Japan, private hospitals introduced the Approach with little involvement of the ministries and agencies as a natural course of events. Furthermore, case in Sri Lanka was initially introduced by the discretion of the hospital head as a new approach, but once much outcome was observed, the Ministry of Health later played a central role to extend the “5S-KAIZEN-TQM Approach” to other hospitals within the country.

In Japan and the USA, KAIZEN activity was conducted based on the PDCA cycle (i.e., the cycle of Plan, Do, Check, Action, hereinafter referred to as “PDCA cycle”). At Takeda General Hospital, members did not respond when the activity leader simply asked them “Please join the activity.” Through this experience, the leader learned that “Promotion of 5S is exactly the same as promotion of work.” In other word, the leader wrote that he/she learned the importance to move the management cycle (PDCA).

All three countries finally recommend, as seen in the condition for expressing outcome, “participation of all divisions including doctors.” In Sri Lanka, the Castle Street Maternity Hospital recorded “it started the activity from a small area and expanded to the entire hospital in the end.” In Japan and the USA as well, the activity was not necessarily started by the entire organization, but started from a pilot division or volunteers.

Regarding Japanese manufacturers, many large companies conduct the improvement activity across the board, while small- and middle-scaled companies usually start with “excavating problems intensively in a limited area of work site, instead of the entire factory,” and then expand it to all divisions after confirming the achievement of the activity<sup>14</sup>. The difference occurs due to the fact that large companies have enough specialist staff, and enough resources to request support from external specialists, and small- and middle-scaled companies do not have enough human/ financial resources. Hospitals in developing countries also generally suffer lack of resources like the small-and-medium-sized companies do, and may be able to take some of the methods of the small-and-medium-sized companies as references.

#### 5) Bottleneck of activity

It is commonly pointed out that it is difficult to involve all staff, especially doctors, with shared understanding. Some view that this is because doctors are specialists who tend to adopt a professional bureaucratic system<sup>15</sup>. However, the “lack of involvement of doctors” itself does not seem a serious bottleneck in the early introduction period as long as it is simply caused by doctors’ disinterest. It would be problematic if doctors and other staff who do not want to change conventional work environment and work procedures become a resistance force.

#### 6) Measures to overcome bottlenecks

Regarding measures to overcome bottlenecks, all the three countries point out that it is necessary for hospital heads or other leaders to understand and lead the activity, and persistently persuade uncooperative members.

In Japan, different techniques were adopted to involve doctors: at Nerima Hospital, one doctor is participated as an observer in each group, instead of starting with all staff involved; Takeda General Hospital started with nurses and other staff, not involving in doctors at first.

In the USA, a bottleneck is that the activity tends to be started with management divisions because of hesitation in involving doctors. There seemed no special technique other than top’s leadership.

#### 7) Measurement indicators (Refer to table 3)

In Japan, the bottom-up activities are measured by point system on outcome of tasks selected by each department and divisions using a check sheet as an indicator. At the same time, for the indicator for the activity outcome implemented top down, a management indicator for management diagnosis is provided by the Welfare and Medical Service Agency.

In the USA, for TQM indicator in hospitals, NDP prepares standard indicators to measure management efficiency that include waiting hours at pediatric department, average time spent on responding to telephone inquiries by nurses, number of defective medical records due to erroneous omission of insurance number etc.

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<sup>15</sup>Yukio Kakiuchi, “KZ Method for factory improvement,” Japan management Consultants Association, 2008

<sup>16</sup>Seiichi Iesato, “A discussion on introduction of TQM in hospital management,” Mita Business Review, Vol. 49, No.5, December, 2006

The Castle Street Maternity Hospital in Sri Lanka has predetermined indicators that are directly related to infections such as infection rate, stillbirth rate, and death rate in childbirth.

**Table 3 Situations of each country regarding improvement of the quality of care**

	The USA Situation in NDP (from <i>Curing Health Care</i> <sup>11</sup> )	Japan Situation in Takeda General Hospital <sup>4</sup> , Iwata City Hospital <sup>5</sup> , Nerima Hospital <sup>6</sup> , Japanese Red Cross Musashino Hospital <sup>16</sup>	Sri Lanka Situation in the Castle Street Maternity Hospital <sup>14</sup>
1) Overall concept	- Prevention of rising medical expenses - Competition among non-profit sector caused by health facilities forced to make profit	(Iwata) Improving hospital management (Takeda) Eliminate wastefulness from hospital management (Nerima) Resolution of deficit (Musashino) Reduction of settlement money associate with medical accidents	Reduction of hospital infection rate
2) Outcome	1. Data collection and analysis by using distribution charts and management charts give the staff new perspective. 2. Staff gained the joy of understanding new things and achieving continuous improvement. 3. Wastefulness, complication, and low reliability influence the cost. Cost can be reduced by eliminating them.	(Iwata) 1. Signs and posters in hospital became more understandable. 2. Things left on shelves and floors are cleared, which freshened the work place. 3. Inventory is carefully managed, and excessive purchase can be avoided. 4. Goods can be easily retrieved thanks to the improved storage and management of goods. 5. Regular and non-regular staff can jointly participate in the activity. (Takeda) 1. Visual management reduced human errors caused by confusion and assumption. 2. Space is effectively utilized thanks to disposal of unnecessary goods. 3. Patient satisfaction is raised by clean hospital and good work of staff. 4. An attitude to steadily practice basic rules is established. (Nerima) 1. Resolution of deficit 2. Sense of solidarity is nurtured across job categories/divisions.	1. Rate of infection during Caesarean section dropped by 52% in 2 years. 2. Rate of infection in newborns dropped by 58% in 2 years. 3. Stillbirth rate per 1000 persons dropped from 10.3% to 6.9% in 2 years. 4. Death rate in delivery per 1000 persons dropped from 1.09% to 0.24% in 2 years. 5. The gap between management divisions and medical divisions was reduced. 6. The improved work environment nurtured among staff a positive way of thinking and confidence in team work.

3) Condition for expressing outcome	<p>1. “Teamwork across job categories is useful for improving process of medical service” : Teams formed across job categories enable the staff to understand the needs of others.</p> <p>2. “Conduct training as early as possible” : Spending more time on education of basic tools enables early achievement of outcome.</p> <p>3. “Medical institutions should perceive quality in a broader view.” : Most hospitals use the word, quality, limited to direct medical treatment. A broader concept as general quality is more useful.</p>	<p>(Iwata)</p> <p>1. All staff in hospital as well as contractors conduct the activity from the beginning.</p> <p>(Takeda)</p> <p>1. In order to maintain the activity, it is necessary for all staff to participate.</p> <p>2. Introductory education given by external experts is more easily accepted by staff.</p> <p>(Nerima)</p> <p>1. It should be a voluntary activity across the board.</p> <p>2. The head of hospital wields the leadership to command, persuade, and explain.</p>	<p>1. Participation of staff in all divisions is necessary for 5S activity.</p> <p>2. At the stages of planning and introduction of 5S, staff should steadily understand the concept of 5S<sup>17</sup>.</p>
4) Process	<p>Procedure 1. Pick up and prioritize problems; establish the project and team</p> <p>Procedure 2. Identify and analyze the cause.</p> <p>Procedure 3. Discuss the measures for solution; conduct the measures and method of management.</p> <p>Procedure 4. Check the level of achievement; monitor the management system</p>	<p>(Takeda)</p> <p>Procedure 1: Formulate an introduction plan</p> <p>Procedure 2: Conduct introductory education</p> <p>Procedure 3: Organize and sort the goods.</p> <p>Procedure 4: Clean and keep cleanliness.</p> <p>Procedure 5: Training and dissemination.</p> <p>Procedure 6: Develop 5S in work</p> <p>(Nerima) (Musashino)</p> <p>1. QC circle activity</p> <p>2. Organize the activity presentation</p>	<p>1. Hospitals started 5S activity on a small scale and expanded it all across the hospital in the end.</p>
5) Bottleneck	<p>1. “It is difficult to involve doctors.” Doctors are busy, and tend to consider “quality assurance” as extra work.</p> <p>2. “The initial interest is focused on the</p>	<p>(Iwata)</p> <p>1. Sorting can be casually done, while ordering and cleaning takes time and persistence.</p> <p>2. Result differs among divisions.</p>	<p>1. Some staffs do not want to change conventional work environment and work procedures.</p>

<sup>17</sup> Toshihiko Hasegawa, Wimal Karandagoda “Change Management For Hospitals” 2011

	<p>process in non-clinical divisions” : The activity tends to be started with management divisions because of hesitation in involving doctors.</p> <p>3. Large-scaled hospitals are operated by two different lines of authorities – i.e. management divisions and medical divisions.</p>	<p>3. It is not easy to involve everyone.</p> <p>4. Staff needs some time to adapt to the change in management method after ordering things.</p> <p>5. Some staff may show resistance.</p> <p>(Takeda) 1. Participation of doctors from the first step is difficult.</p> <p>(Nerima) 1. It is difficult for doctors to participate in the activity.</p> <p>2. Burdens on doctors and nurses increase.</p>	<p>2. Fund for activity cannot be obtained from the Ministry of Health.</p>
6) Measures to overcome bottleneck	<p>1. “Leaders control the destiny of quality improvement both in the health sector and industry sector. : In the project, hospitals where management top took initiative achieved a great success.</p>	<p>(Iwata) 1. Sorting and ordering should be casually done.</p> <p>2. All staff should participate under the understanding top management.</p> <p>(Takeda) 1. Participation of doctors should not be forced at an early stage of introduction.</p> <p>2. Doctors should be involved in the end.</p> <p>(Nerima) 1. At least one doctor should be included in each activity group.</p> <p>2. Accumulated successful experiences nurture sense of achievement.</p>	<p>1. Activities started from the office of the head boosted the motivation of the staff.</p> <p>2. The head of the hospital took action to collect sponsors from commercial organizations.</p>
7) Indicators	<p>(Example of indicators at NDP)</p> <p>1. Waiting hours at pediatric department</p> <p>2. Average time spent on responding to telephone inquiries by nurses</p> <p>3. Number of defective medical records due to erroneous omission of insurance number etc.</p>	<p>(Takeda)</p> <p>1. Points of outcomes by check sheet to monitor ordering</p> <p>2. Level of achievement on target item (what), target level (to what extent), and implementation period ( by when) selected by work site</p> <p>Reference : (Welfare and Medical Service Agency)</p> <p>25 indicators in 5 items – functionality, cost appropriateness, productivity, stability, and profitability, which are selected for the simple management diagnosis tool.</p>	<p>1. Rate of infection during Caesarean section</p> <p>2. Rate of infection in newborns</p> <p>3. Stillbirth rate</p> <p>4. Death rate in delivery</p>



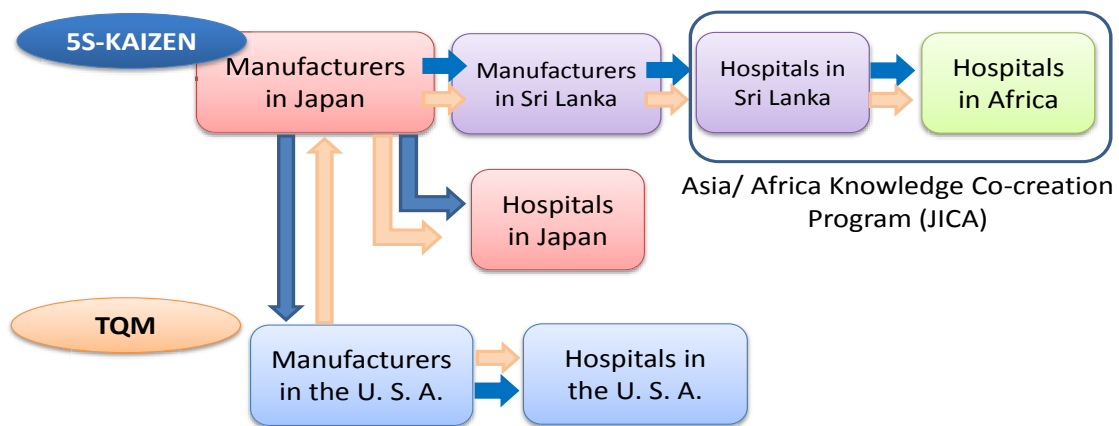
**2.2.1.2 Consequence of adoption of 5S-KAIZEN-TQM in Japan, the USA, and Sri Lanka, and development in Africa**

5S-KAIZEN is a method to improve management started from the automobile industry in Japan. The bottom up activity is voluntarily conducted by small groups to improve the work site. The activity has been widely adopted by other manufacturing industries. TQM is a top down management method started by manufacturers in the USA. It is a method to optimize the whole company by viewing management from a wider perspective. TQM came to Japan, was merged with the bottom up method of 5S-KAIZEN, and was developed as 5S-KAIZEN-TQM unique to Japan<sup>18</sup>.

Some advanced Japanese hospitals, as already mentioned, tentatively adopted 5S-KAIZEN which was used by Japanese manufacturers since mid-2000s in order to refurbish hospital management and to prevent medical accidents. 5S-KAIZEN was included in the “General Measures to Promote Medical Safety” by the Ministry of Health, Labor and Welfare, and then spread all across Japan.

As many as 21 hospitals in the USA conducted NDP to adopt TQM which was used by manufacturers to improve hospital management since 1997 with the background of criticism against rising medical costs. The Castle Street Maternity Hospital in Seattle heard that a local manufacture introduced Toyota Production method, introduced it as a TQM tool<sup>19</sup> in 2002, and achieved a great outcome. The method then spread hospitals all across the USA.

In Sri Lanka, the Castle Street Maternity Hospital aimed for reducing the hospital infection rate. Then hospital head learnt the Japanese style management which was introduced to a local company (manufacturer) from Japan, and practiced it as a method to improve work environment. Thereafter, a JICA introduced the successful case starting from 2007 as part of the “Asia Africa Knowledge Co-Creation Program” and expanded operations to eight African countries which will form the first group of African the “Program of TQM for Better Hospital Services”, and achieved certain outcomes.



**Figure 4 Sequence of how quality improvement in medical field reached Africa**

<sup>18</sup> “TQC kara TQM e (from TQC to TQM)”, Teisuke Kitahara, 1991; Yuhikaku sensho

<sup>19</sup> Charles Kenney “ Transforming Health Care: Virginia Mason Medical Center's Pursuit of the Perfect Patient Experience” Productivity Press Taylor & Francis Group 2011

### **2.2.1.3 Analysis of log frame of projects under the “Program of TQM for Better Hospital Services”**

Regarding projects being conducted in 15 African countries, based on relevant materials such as Project Design Matrix (PDM), overall goal, project purpose, outcome, activity and indicators to evaluate activity outcome were cross-sectionally surveyed and analyzed. Furthermore, since the “Program of TQM for Better Hospital Services” is a set of cooperation preparation survey and training programs in each country, no PDM is created in individual hospitals. Therefore, the framework of the cooperative preparation survey comprising the program was referred to as the reference data. Furthermore, this evaluation analyzed each PDM and preliminary evaluation from the viewpoint of how to incorporate into the project design the solution of the general yet major problems experienced by the hospital by utilizing the “5S-KAIZEN-TQM Approach” No technical cooperation project covered individual hospital alone, however, and there was a case of the “5S-KAIZEN-TQM Approach” not necessarily linked directly to the project target when formulating the project or a case where the fundamental task of the hospital is not directly presented as the project targets and overall goals. This analysis was conducted from the viewpoint of whether the fundamental problem has been reflected in the project targets and overall goals while recognizing the existence of such case.

The following Table 4 is a list of surveyed project names such as PDM and summaries of the contents.

**Table 4 Objectives and outcome of project**

	Project name (Country name)	Project purpose	Content	Outcome indicators ※Extracting only indicators related to 5S-KAIZEN-TQM
1	AAKCP ” Program of TQM for Better Hospital Services” (15 African countries)	In the participating countries, direction of hospital reform led by management of healthcare and medical service provision system is clarified, where specific measures to improve healthcare medical service can be introduced without external support even under the chronic lack of resources are proposed.	1) Improve hospital management by utilizing 5S-KAIZEN-TQM. 2) Hospital management, the Ministry of Health and policy maker prepare proposal of feasible strategy/ policy to improve hospital management to submit other countries and donor society. 3) Healthcare system will be strengthened by utilizing the fostered healthcare human resource.	-
2	“The Project for Strengthening Capacities of Prince Régent Charles Hospital and Public Health Centers in Bujumbura City for Improvement of Mother and Child Health” ( Burundi)	Implementation of the mother and child care under the better operations in the facilities.	1) Development of the top and middle management 2) Improvement of the working environment through 5S implementation led by the managements 3) Preventive maintenance is consequently implemented by the participation of all the staffs in the maternity and the maintenance department 4) Strengthen the skills and knowledge of nurses in the field of mother and child health	1-a)5S Committee is established in PRC Hospital and State Public Health Institutions 1-b) 5S Implementation Activity team is placed in target facilities 1-c) Quality control policy is posted in target facilities 1-d) WIT Activity report is prepared monthly 2)The following 5S Activities are implemented by WIT (monitoring record) at target facilities (1)Separation rule for hazardous and medical wastes are enacted and separation is implemented (2) The method of material storage by rules are regulated and implemented (3) Patient’s seats in waiting rooms are installed and utilized in appropriate locations
3	“Project for Reinforcement of Health System	Enhance management capacity focusing on outcome at the Medical	1) Enhance capacity of the Medical Bureau and Health Post in those regions to formulate plans and evaluate monitoring (M&E).	(1) A system for improving resource management capacity (team of trainers, training modules, implementation guidelines, training frameworks, monitoring-evaluation

	Management in Tambacounda and Kedougou” ( Senegal)	Bureau and Health Post in those regions.	<p>2) By utilizing 5S-KAIZEN-TQM, capacity of resource (human resource, accounting/finance, drugs, medical materials and equipment, facilities and system) management of Medical Bureau and Health Post shall be improved.</p> <p>3) The experience of the project shall be shared in and around Tambacounda and Kedougou.</p>	<p>mechanism and funding mechanism) will be established by the end of the year 2013.</p> <p>(2) Before the end of 2012, an initial version of 5S-KAIZEN-TQM Practical Guide will be developed.</p> <p>(3) Before the end of 2012, training sessions in 5S-KAIZEN-TQM will be conducted in the 10 Health Centers.</p> <p>(4) Before the end of 2013, a final version of 5S-KAIZEN-TQM Practical Guide will be developed.</p> <p>(5) Before the end of 2013, the Guide on resource management will be developed.</p> <p>(6) Before the end of 2013, over 80% of management teams of Medical Region Offices and Health Districts will attend training on the different guides/tools on resource management (such as human resource, accounting/finance, medical equipment and facility management, etc.).</p>
4	“Strengthening Development for Human Resource for Health” ( Tanzania)	Strengthen healthcare human resource and human resource.	<p>1) Strengthen capacity of healthcare human resource planning by efficiently utilizing healthcare human resource information system and educational organization information system.</p> <p>2) Utilize 5S-KAIZEN-TQM to improve/ enhance quality of healthcare and medical service.</p>	<p>1. The level of understanding on quality improvement is improved for health and social welfare workers and tutors trained on 5S-KAIZEN(CQI)-TQM</p> <p>2-a) The level of understanding on quality improvement is improved for health and social welfare workers and tutors trained on 5S-KAIZEN(CQI)-TQM</p> <p>2-b) Number of health facilities and institutions which, utilizing trained personnel, practice and disseminate the “5S-KAIZEN-TQM Approach”</p> <p>※80% of 5S implementing hospitals achieve 5S Progress Score* growth of more than 20 points.</p>
5	“Project on Improvement of Health Service through Health Infrastructure Management” (Uganda)	Improve management and use of healthcare infrastructure.	<p>1) Implementation of 5S-CQI-TQM in the selected health facilities in the country.</p> <p>2) Improvement of the utilization of medical equipment</p> <p>3) Improve/ strengthen maintenance/ management of medical equipment in the national workshop.</p>	<p>1) The ratio of health facilities which have been assessed to have improved the workplace environment based on 5S-CQI-TQM check sheet increases</p>

6	Expert on 5S-KAIZEN-TQM for Hospital Management (Malawi)	Provide healthcare and medical service with high quality	<ol style="list-style-type: none"> <li>1) 5S-KAIZEN-TQM guidelines and manuals are issued.</li> <li>2) Establishment of the National quality improvement support team (N-QIST) and the regional QIST as the core groups and their capacity is strengthened</li> <li>3) 5S and KAIZEN are introduced stepwise to the hospitals by the N-QIST and the regional QIST.</li> <li>4) Strengthen the 5S implementation capacity of WIT.</li> </ol>	-
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In addition, information gathering and verification was conducted on the “Technical Advisor to the Secretary General of the Ministry of Public Health” of Congo, the “The Project for Improving Maternal, Newborn and Child Health in the Lagos State” of Nigeria, and the “Adviser of Continuous Maternal and Child Health Care” in Morocco but the adoption of the “5S-KAIZEN-TQM Approach” was not clearly indicated and those were excluded from the subject of review. The following is a summary of: ① overall goals and indicators, ② project purpose and indicators, ③ project outcome and indicators, ④ activities of the “5S-KAIZEN-TQM Approach” and outcome, ⑤ precondition of the project, ⑥ external condition of the project, and ⑦ result of logic validation of PDM subject to the survey regarding the above-listed projects.

① Overall goals and indicators (Refer to Table 5)

“Improvement of the quality of care” regarding medical service was selected as an overall goal by the five projects; “Improvement of health status” by one project. For indicators of overall goals, “Implementation of patient satisfaction” was used by three projects, the highest number. As many as two projects use health statistics figures such as mortality rate, number of medical treatments, and number of referrals from other hospitals at health facilities. One project uses similar statistics figures in the region. The AAKCP, “Program of TQM for Better Hospital Services” did not set standard indicators for overall goals, because it is a set of cooperation preparatory investigation and the training programs according to the area.

**Table 5 Comparison of overall goals and indicators in target projects in each country**

	Country name	Overall goal				Indicators of Overall goal				
		Improvement of the quality of care	Improvement of health status	Improving hospital management	Implementation of national policy	Implementation of patient satisfaction	Health statistics (health facilities)	Health statistics (region)	Operating figure	Other
1	” Program of TQM for Better Hospital Services” AAKCP			✓						
2	Burundi	✓				✓	✓			
3	Senegal		✓					✓		
4	Tanzania	✓				✓				
5	Uganda	✓				✓	✓		✓	
6	Malawi	✓								

② Project purposes and indicators (Refer to Table 6)

Project purposes are divided into the following three fields: Improving management capacity; improving the quality of care; and improving hospital management. Each of the five countries selected “improving the quality of care,” or “improving staff capacity”, while the “Program of TQM for Better Hospital Services” selected “improving hospital management. Four projects, which is a majority, selected a goal related to human resources; “improving management capacity.” It is possible to thus surmise that in this region, the solution of the shortage of labor is an urgently required task. Next, improvements of the quality of care” had been selected for two cases. “Improving hospital management” was selected by the AAKCP’s “Program of TQM for Better Hospital Services” alone.

As an indicator for measuring the achievement level of project purposes, the “achievement ratio for national policy objectives” was found to be the most frequently used indicator, favored for the four projects. This fact seems to be associated with the situation in Burundi which targets the managerial staff at healthcare facilities, and projects in Senegal and Tanzania, which aim to improve the management capacity of staff at state organizations. Senegal set execution rates for the municipal government action plan and annual activity plan (PTA: Plan de Travail Annual) as scheduled by both the State Medical Agency and the Public Health District. Tanzania aims to “increase the ratio of states that fulfill objectives related to personnel in public health.” Uganda targets hospitals, and each year, the national government publishes hospital rankings, which are compiled in its Healthcare Sector Performance Annual Report. The changes in the ranking are used as indicators.

Burundi and Uganda also use “check sheet scores for 5S activity” as an indicator for project purposes. Their logic for the achievement of goals is not clear.

Burundi, Tanzania, and Uganda use the “number of hospitals where improvements were produced by 5S” as an indicator. Burundi alone clarifies the definition of “improvement” on PDM. The other two countries use indicators based on their “5S progress scores” and “5S-KAIZEN-TQM check sheet” activity.

**Table 6 Project purposes of target project in each country**

	Country name	Project purpose			Project purpose indicators					
		Improvement of management capacity	Improvement of the quality of care	Improving hospital management	Numerical goal of national policy	Indicators of 5S activity	Number of hospitals improved by 5S	Annual activity plan	Survey on patient satisfaction	Other
1	” Program of TQM for Better Hospital Services” AAKCP			✓						
2	Burundi		✓		✓	✓	✓		✓	
3	Senegal	✓			✓			✓		
4	Tanzania	✓			✓		✓			
5	Uganda	✓			✓	✓	✓			
6	Malawi		✓							

③ Outcome and indicators of the project (Refer to Table 7)

Project outcome should correspond to project purpose. However, some items do not clearly show the relationship between the goals and outcomes. Overall, many selected the execution of the activities itself as the indicator and activities themselves seem to have become their objectives in overall outcome indicators. In order to incorporate the “5S-KAIZEN-TQM Approach” effectively in each project, it is effective that the process from the activity to effect be shown in a standardized diagram along with outcome indicators.

(1) Activity and outcome of the “5S-KAIZEN-TQM Approach” (Refer to Tables 7 and 8)

The activities of the “5S-KAIZEN-TQM Approach” confirmed by PDM and other reports were implementation of trainings that include training of top leaders (TOT) and circuit type trainings. Six projects implemented trainings. All the six projects conducted 5S-KAIZEN-TQM activity although the stages differed among countries. Five projects conducted monitoring and evaluation of 5S-KAIZEN-TQM (M&E).

Looking at the activities by country, Tanzania and Uganda had advanced activities that have established training, activity, award and evaluation. Burundi and Malawi seem to have established a series of activities from training, activity and evaluation although it does not include an award system.

Table 8 summarizes the outcomes of KAIZEN-TQM in target projects. Regarding the “Program of TQM for Better Hospital Services”, Eritrea, Madagascar, Mali, Burkina, Congo, and Malawi achieved outcomes at the KAIZEN level. In other countries, outcomes still remain at 5S level, most of which are at output level of 5S activity as far as we can confirm in the literature review.

Regarding individual projects for each country, Tanzania and Malawi achieved outcomes at the KAIZEN level. Senegal seemed in the preparation stage before the start of the activity (S0) at this time point. In other countries, most outcomes are in the outcome level. This is probably because of the difference of perspective where the “Program of TQM for Better Hospital Services” is mainly utilizing the method of 5S-KAIZEN-TQM while technical cooperation projects use the “5S-KAIZEN-TQM Approach” as a tool as a part of activities in order to achieve the goal for higher concept. Such difference is seen in the planning stage of PDM etc. whether such difference is seen in activities should be confirmed by on-site survey.

**Table 7 Details of the activity of the “5S-KAIZEN-TQM Approach”**

	Country name	Establish committee /team	Formulate/ implement plan	Formulate guideline/ manual	Training (including TOT and circuit type trainings)	Implement activities	Award system	Monitoring and evaluation (M&E)	Cooperation of project in other countries
1	” Program of TQM for Better Hospital Services” AAKCP				✓				
2	Burundi				✓	✓		✓	
3	Senegal		✓		✓			✓	
4	Tanzania				✓	✓	✓	✓	✓
5	Uganda	✓	✓	✓	✓	✓	✓	✓	
6	Malawi	✓			✓	✓		✓	



**Table 8 Major output of 5S-KAIZEN-TQM in target projects**

“Program of TQM for Better Hospital Services”	
<ol style="list-style-type: none"> <li>1. Organize the warehouse ( Niger) S1, S2</li> <li>2. Sort garbage ( Benin, Congo, Burundi) S3</li> <li>3. Clean the hospital ( Tanzania, Eritrea) S3</li> <li>4. Label drugs ( Niger) S4</li> <li>5. Improve signs in hospital (Congo, Niger, Madagascar) S4</li> <li>6. Prepare 5S manual; foster training instructors ( Senegal) S4</li> <li>7. Formulate hygiene standard ( Burundi) S4</li> <li>8. Post an organizational chart and slogan (Burkina, Senegal) S4</li> <li>9. Staff’s attitude changed in a positive way. ( Mali) S5</li> <li>10. Dissemination by 5S posters ( Benin, Burkina, Madagascar) S5</li> <li>11. Regular meeting ( Senegal, Benin, Burundi, Tanzania, Uganda) S5</li> <li>12. Hosting hospital contest ( Mali) S5</li> <li>13. Improve layout of beds and reception division (Eritrea, Madagascar) S5,KAIZEN</li> <li>14. Conduct a survey on patient satisfaction ( Mali, Burkina) S5, KAIZEN</li> <li>15. Conduct hospital 5S training (Congo, Malawi) KAIZEN</li> <li>16. Recycle equipment ( Niger) KAIZEN</li> </ol>	<p>S0 : Preparation for 5S            S1 : Seiri (Sort)            S2 : Seiton (Set in order)            S3 : Seiso (Shine)            S4 : Seiketsu (Standardize)            S5 : Shituke (Sustain)</p>
Technical cooperation project by country	
<p><b>Burundi :</b></p> <ol style="list-style-type: none"> <li>1. Formulate/ implement hygiene criteria. (S4)</li> <li>2. Introduce trash cans exclusively for medical waste materials (S3)</li> <li>3. Formulate/ implement rules to store goods. (S4)</li> <li>4. Install new benches for outpatients at appropriate locations. (S2)</li> <li>5. Nurture sense of responsibility in healthcare staff to provide better service. (S5)</li> </ol> <p><b>Senegal :</b></p> <ol style="list-style-type: none"> <li>1. Prepare first draft of “Illustration/ manual to practice 5S” and “Guideline for instructors to practice 5S” (S0)</li> <li>2. Foster 5S Training instructors (S0)</li> <li>3. Implement manual 5S Training based on the guideline. (S0)</li> </ol> <p><b>Tanzania :</b></p> <ol style="list-style-type: none"> <li>1. 5S was practiced by 55 hospitals.</li> <li>2. Foster 25 central instructors and 63 state instructors. (S4)</li> <li>3. Reduce waiting hours of outpatients. (KAIZEN)</li> <li>4. Increase income in association of reviewing excessive inventory and improving accounting operation. (KAIZEN)</li> <li>5. About 80% of participants in training should achieve at least 60% of right answer rate in the post-training test.</li> </ol> <p><b>Nigeria :</b></p> <ol style="list-style-type: none"> <li>1. Hold 5S monitoring/ workshop. (S5)</li> <li>2. Agree that a responsible person respectively from the State Ministry of Health, LGSC, and JICA forms a team and conducts monitoring every two months in the starting period of the activity.</li> </ol> <p><b>Congo :</b></p> <p>Confirm the progress of 5S-Kaizen-TQM dissemination program and dissemination plan.</p> <p><b>Morocco :</b></p> <p>Action plan was formulated. (S0)</p>	

Malawi :

1. According to the evaluation by the evaluation table, achievement rate of S1-S3 activities are insufficient in most facilities that implemented the activity.
2. The laboratory test room at Mzimba State South Hospital alone conducted “Small Improvement” activity. (KAIZEN)

(2) Precondition of the project

Precondition was established by only the following three countries –i.e. Senegal, Tanzania, and Uganda.

- Counterpart organization does not object to implementation of the project. (Senegal)
- HRHIS spread in five states. TIIS’s data collection training was completed in one zone. (Tanzania)
- Domestic disturbance should not be caused by general election. (Uganda)

(3) External condition of the project

As external conditions, continuous involvement of counterpart and continuous support in terms of governmental policy are mainly mentioned. Other conditions are as follows:

- Staff who underwent training should keep working. (No resignation, absence or transfer)
- High commitment of the government should continue.
- Budget should be ensured. (Budget to implement the project, wages for counterparts, national budget)
- Personnel should be arranged/ secured.
- Security should not be deteriorated.

(4) Result of verification of logic of PDM subject to the survey

Target PDM was analyzed. The logic of project purpose by using the “5S-KAIZEN-TQM Approach” was verified. The following four problems were extracted from the verification.

- 1) The standpoint of hospital management, which falls under the higher concept of 5S activity in hospitals, is not sufficiently reflected in project design and indicators.
- 2) Indicators of output regarding 5S activities remain in output level.
- 3) Process of operational KAIZEN is not sufficiently reflected in project design.
- 4) Although impact levels such as patient satisfaction are included in overall goals, some inappropriateness is seen in part of the relationship with project purposes.

The following explains the four problems one by one.

- 1) The standpoint of hospital management, which falls under the higher concept of 5S activity in hospitals, is not sufficiently reflected in project design and indicators.

The “Program of TQM for Better Hospital Services” alone proclaims the standpoint of hospital management. However, indicators to measure the outcome were not presented because it was a cooperation preparation survey. If “improvement of patient satisfaction” is considered as a management indicator at a hospital, Mali and Burkina conducted a “Survey on patient satisfaction.” Burundi also aims to “improve the level of satisfaction” through a “patient survey.” However, no project aims at general improvement of hospital management such as reduction of time and cost spent per patient by improved efficiency. Even if considering that public hospitals provide medical service for free in many countries, the standpoint of hospital management is still important in order to provide medical service for as many citizens as possible with a limited budget.

2) Indicators of outcome regarding 5S activities remain in output level.

In the “Program of TQM for Better Hospital Services”, as mentioned in ④, activity and outcome of the “5S-KAIZEN-TQM Approach”, most outcome indicators remain at the output level such as “Label drugs” and “Sort trash” (Table 8). Outcomes of higher level may not be expressed by 5S alone. However, in most cases, indicators for direct outcome level can be set. Responsible persons may voluntarily think of what to do when given an opportunity to set higher indicators. For example, under the setting, “Label drugs,” responsible person would do only what is directed, in this case, labeling. If given an indicator “Shorten the time to check drug inventory,” they could voluntarily think of what to do to shorten the time. (Details will be explained in Chapter 4)

3) Process of operational KAIZEN is not sufficiently reflected in project design.

With respect to the “Program of TQM for Better Hospital Services” and Morocco’s PDM, indicators were not selected when the project started. It was due to the fact in the “Program of TQM for Better Hospital Services”, no selection of indicator was required because it was the preparatory survey.

In Congo, in order to “Enhance capacity of agencies engaging in healthcare human resources to manage organization,” the project outcome, “Improve work environment”, is selected as one activity. One method to achieve it is to introduce “Implement 5S activity.” However, outcome indicators are “Prepare healthcare human resource files” and “Prepare annual activity plan,” and do not show clearly how “Implementation of 5S activity” is related to “Improvement of work environment,” or appropriate indicators to expect the effect do not seem clear.

In Malawi, because the project is related to the dispatch of a 5S specialist, no PDM was prepared while the goals stated were “Building the introduction system of 5S-KAIZEN-TQM in nationwide public health and health facilities.” The process and indicators to the overall goal, “Improve quality of medical service to be provided” are not shown. It seems the implementation of 5S itself is taken as a subject of emphasis.

4) Although impact levels such as patient satisfaction are included in overall goals, some inappropriateness is seen in part of the relationship with project purposes.

Burundi, Tanzania, and Uganda selected “Improvement of patient satisfaction” as an overall goal indicator.

Burundi’s project selected “Reduce maternal mortality rate,” “Reduce infant mortality rate,” and “Improve access to and quality of service” as project purposes. These are logically consistent with “Improvement of patient satisfaction.”

Tanzania selected “Enhance the healthcare human resource development plan and enhance healthcare human resource that can provide high quality health and medical services” as a project purpose. One of the indicators is linked to the overall goal of “patient satisfaction” as the party who receives such services by point system, which rates the status of practical and specific improvement brought by the introduction of 5S-KAIZEN-TQM in each hospital and by confirming the hospital where there was an improvement.

Uganda selected “Improve management and use of healthcare infrastructure” as a project purpose. The outcomes are “expansion of 5S-KAIZEN-TQM activities”, “improvement of usage status of medical equipment”, and “improvement and enhancement of the maintenance and management of medical equipment in the subject hospitals and maintenance and management workshop of medical equipment”. It has the indirect effect of the “5S-KAIZEN-TQM Approach”, but is logically a leap.

As stated above, literature review extracted four problems, which shall be verified through on-site survey and interview to experts.

### 2.2.2 Interview survey

As a domestic interview survey conducted before starting on-site operation, Iwata City Hospital in Shizuoka Prefecture, which introduced 5S and has made a great achievement, was observed. Three experts who engaged in introduction of the “5S-KAIZEN-TQM Approach” in 15 African countries were interviewed (Subjects of interviews are shown at the end of the report as attached material.).

Interviews aim to assess characteristics to be considered at the health sectors in 15 African countries and lessons learned through the project such as differences from Japan as realized at the work site.

The following are the content of the interviews summarized by category.

- Positioning of the “5S-KAIZEN-TQM Approach”
  - 5S is a method to improve management that is used for promoting reforms in awareness of staff and improving organizational capacity.
  - The “5S-KAIZEN-TQM Approach” is useful for enhancing motivation of medical staff and other workers. It does not have a direct impact on maternal mortality or relevant indicators.
- Points to make the project successful
  - Promotion and success of 5S heavily rely on the head of hospital. However, since the capacity of the head alone is limited, organizational efforts are necessary - i.e. QIT that provides follow-up and approval for records and reports submitted by WIT.
  - In order to practice the “5S-KAIZEN-TQM Approach” it is important for a medical facility to be aware of the problem in the beginning. In order to continue the activity proactively, it is necessary to visually show the process where these problems are being solved and outcome of what they are working on.
  - The stage of 4S (standardization) is difficult because most of the hospitals make the effort to document the implementation status of one’s own activities, extract good cases and standardize their work for the first time, and prior to the introduction of 5S, the external professionals conduct operations based on the manuals prepared by them in many cases.
  - In the transitional stage between 5S and KAIZEN, they need the ability to be sensitive to the problems, find problems and solve them by themselves in 5S.
- Problems seen when conducting the project etc.
  - Basic information such as data on hospital infections, accidents and closing account, which functions as a basis to measure the effect of the project, is not well managed in African countries, causing problems when conducting the project.

- Human resource for health care is short both in terms of quality and quantity. The “5S-KAIZEN-TQM Approach” alone may not achieve outcome generating.
- Scale and function of hospital
    - Dissemination of the approach is difficult where the scale of the hospital is too big that supervision of QIT can not extend to the whole hospital. It is better to start within a small range where QIT and the head of hospital can provide sufficient supervision.
  - Involvement of the Ministry of Health
    - The roles to be played by the Ministry of Health include summarizing the outcome of the “5S-KAIZEN-TQM Approach” into forms of such documents as manual and guideline of the government policy.
    - In a Nigerian hospital, improved service generates good reputation, attracting so many patients that staff became too busy to deal with them. For such a case, a system is necessary where the Ministry of Health timely follows problems in a hospital to make an optimal arrangement of human resource.
    - Some countries include 5S outcome as indicator to evaluate performances for Performance-Based Finance (PBF : a framework to allocate budget according to performance). Since this could be a motivation for health facilities to proactively promote the “5S-KAIZEN-TQM Approach”, the Ministry of Health should consider the introduction.

The problems above were extracted from the interviews with experts. Among problems pointed out in the interviews, it is considered necessary to obtain information on specific problems identified by hospitals such as indicators to be selected for the outcome of the “5S-KAIZEN-TQM Approach”

### 2.2.3 Summary of domestic survey

The following issues were pointed out by the domestic survey.

- 1) KAIZEN is, as seen in the activity process in Japan and the USA, essentially an activity to find problems in the work place with management improvement as the overall goal, and continuously conduct PDCA cycle for solution.
- 2) 5S activity requires little cost and input.
- 3) KAIZEN and TQM activities do not necessarily require company-wide introduction. These activities can be introduced in a scale according to the situation of the organization.
- 4) Management/ control method used by manufacturers has been adopted by health facilities in Japan, the USA and other advanced countries, where hospital management is improved through improved work environment, work efficiency and quality of medical service.
- 5) Hospitals in Japan, the USA, and Sri Lanka assessed problems in their management by themselves, and voluntarily started the activity without relying on ministries and agencies. However, the hospitals in Japan and the United States are private hospitals and the Sri Lankan Ministry of Health became the driving force to implement the approach nationwide after the success.
- 6) This method was started by Japanese manufacturers, introduced via Sri Lankan manufacturers, and achieved outcome in a Sri Lankan hospital. The successful experience at the Sri Lankan hospital is facilitating the introduction of the activity to health facilities in the 15 African countries through JICA’s “Asia/ Africa Knowledge Co-creation Program.”

7) In the introduction of the “5S-KAIZEN-TQM Approach” in the 15 African countries, most outcomes remain at the output level. Many outcomes were confirmed in improvement of work environment and quality in hospitals.

The following are problems in projects confirmed by PDM, relevant reports, and interview with specialists.

- 1) The standpoint of hospital management, which falls under the higher concept of 5S activity in hospitals, is not sufficiently reflected in project design and indicators.
- 2) Indicators of output regarding 5S activities remain at output level.
- 3) Process of operational KAIZEN is not sufficiently reflected in project design.
- 4) Although impact levels such as patient satisfaction are included in overall goals, some leap is seen in the relationship with project purposes.
- 5) For evaluation indicators of projects, such data as hospital infection, accident rate, and financial data are not selected and obtained.
- 6) Healthcare human resource is in short qualitatively and quantitatively. The introduction of the “5S-KAIZEN-TQM Approach” alone may not be sufficient to achieve outcome generating that leads to the improved function of the hospital.

Health facilities in African countries face various problems different from those in advanced countries. All problems they face on site may not be solved by the quality improvement activity. This fact should be taken into consideration when formulating project design. As external conditions, staff’s turn over, policy changes and security should also be considered.

#### **2.2.4 Information to be assessed by on-site survey**

The following points were considered to be further assessed to verify the hypotheses and establish the logic based on the fact of the project such as interviews and on-site survey etc.

- Specific problems each hospital faces ( Hypothesis 1)
- Examples of improved work environment and work which actually occurred at work site ( Hypothesis 1)
- Change in behavior and phenomena linked to outcome ( Hypothesis 1, Hypothesis 2)
- Factors that inhibit transition from 5S to KAIZEN ( Hypothesis 2)
- Reasons why the activity cannot be continued and bottlenecks ( Hypothesis 2, Hypothesis 3)
- Methods/ examples to overcome bottleneck in order to continue the activity ( Hypothesis 2, Hypothesis 3)
- Factors to facilitate generating outcome ( Hypothesis 3, Hypothesis 4)
- Policy-wise positioning of the “5S-KAIZEN-TQM Approach “on site ( Hypothesis 4)
- Conditions where outcome, indicators, and approach by other donors’ activity are effective; bottleneck; similarity/ difference/ and affinity with the “5S-KAIZEN-TQM Approach” ( Hypothesis 4)

#### **2.3 On-site survey**

In this survey, an on-site survey was conducted in Senegal and Tanzania where introduction of the “5S-KAIZEN-TQM Approach” has been relatively advanced among the 15 countries. Interviews to those involved on site, focal group discussion, collection of materials, and tour to health facilities were conducted.

The on-site survey aims to collect opinions of the head and staff of hospitals regarding the “Approach”, and to assess what kind of activity is actually conducted in facilities through

on-site cases and materials. It is to be conducted based on the information obtained from the domestic survey, verify the information, and obtain points to consider and lessons necessary to form project logic by assessing the comments of those engaging in 5S on site and outcomes.

The survey was conducted in these two countries which are distant to each other, within a limited survey period. Accordingly, the survey focused on facilities and goods, and other information was not sufficiently collected.

### 2.3.1 Outline of hospital visit in Tanzania and Senegal

Details of health facilities we visited in Tanzania and Senegal are summarized in a list in the Attached Material 7. The outline of target health facilities are summarized according to competent authorities, scale, location, and characteristics. Table 7 lists facilities in Tanzania, and Table 8 in Senegal. We visited a total of 5 facilities some of which were of large scale with 1,500 hospital beds and others of middle scale with 80 beds in Tanzania. In Senegal, we visited three middle-scale hospitals with 100~300 beds and three small scale facilities with about 20 beds called Health Centers/ Health Posts.

The pilot hospital in the “Program of TQM for Better Hospital Services” was the Mbeya Consultant Hospital in Tanzania, and the pilot hospital in Senegal was the Tambacounda Regional Hospital.

**Table 9 Health facilities surveyed in Tanzania**

Item	Mhinbili Hospital	Mbeya Consultant Hospital	Tosamaganga Hospital	Mbalizi Hospital	Mbeya Regional Hospital
Competent authorities	Ministry of Public Health and Welfare (national)	Ministry of Public Health and Welfare (quasi-national)	Roman Catholic Church	Evangelical Church	Mbeya Region
Location	Dar es salaam	Mbeya Region	Iringa	Mbeya Region	Mbeya Region
Number of hospital beds	1,500	477	164	150	80
Number of staff	2,700	860	200	108	198
Characteristics	The urban hospital representing the country.	The pilot Hospital where 5S is advanced most.	The Catholic hospital started 5S on its own.	The Catholic hospital has just started 5S.	Promoted by strong leadership of the hospital head.

**Table 10 Health facilities surveyed in Senegal**

Item	Thies Hospital	Grand-Yoff Hospital	Tambacounda Regional Hospital	Tambacounda Health Center	Gaspard Camara Health Center	Kotiary Health Post
Competent authorities	Ministry of Health (national)	Ministry of Health (national)	Ministry of Health (national)	Tambacounda Region Medical Office	Dakar Region Medical Office	Tambacounda Region Medical Office

Location	Thies Region (two hours from the Capital)	Dakar	Tambacounda Region	Tambacounda Region	Dakar	Subarb of Tambacounda City
Number of hospital beds	324	237	115	24	24	Few
Number of staff	210	693	163	70	98	7
Characteristics	The hospital recycles unnecessary items.	The pilot Hospital where 5S is advanced most.	The pilot Hospital where 5S is advanced most.	Under supervision by the Ministry of Health	Promoted by strong leadership of the hospital head.	Promoted in cooperation with residents in the region

### 2.3.2 Summary of the result of on-site survey (Refer to Table 11)

The result of the on-site survey conducted at 5 facilities in Tanzania and 6 facilities in Senegal are categorized by the following 14 items.

- ① Positioning of the “5S-KAIZEN-TQM Approach” in government policy
- ② Outline of the medical institution
- ③ Main problems specific to the hospital
- ④ Motivator for starting 5S
- ⑤ Factors Inhibiting start/ implementation of 5S
- ⑥ Content and current status of KAIZEN activities
- ⑦ Divisions for initial introduction of 5S activities and their selection
- ⑧ Activities of Head of Hospital
- ⑨ QIT activities
- ⑩ Activities and Outcomes
- ⑪ Factors for promotion by implementing the “5S-KAIZEN-TQM Approach”
- ⑫ Collaboration with other donors; presence/ absence of synergy
- ⑬ Other (regional characteristics)
- ⑭ Other ( Hospital finance)

**Table 11 Summary of result of on-site survey in Tanzania and Senegal**

① Positioning of the “5S-KAIZEN-TQM Approach” in government policy	<p><b>【Tanzania】</b></p> <p>1) The outcome achieved by the Mbeya Consultant Hospital in the 2007 “Program of TQM for Better Hospital Services” was recognized as a practical/ efficient method to improve work environments by the Ministry of Public Health and Welfare.</p> <p>2) The Ministry formulated the Strategy to Develop Human Resource for Public Health (2008-2013) with support from JICA and WHO. Regarding establishment of Human Resource for Healthcare Information System (hereinafter, HRHIS), which would be the core of the Strategic Goal 1), “Enhance capacity to formulate plans in developing healthcare human resource” as well as establishment of Human Resource for Healthcare Training Institution Information System (hereinafter, TIIS), which would be the foundation of the Goal 3), “Enhance provision of training to foster human resource for healthcare/ management system and ensure quality of training.” JICA has dispatched specialists exclusively to enhance development of human resources for public health to the Ministry of Public Health and Welfare since November 2008, and</p>
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	<p>has trained managerial staff in hospital for total quality management (TQM) in 5S-KAIZEN-TQM Approach.</p> <p>3) The Ministry formulated in 2009 the “Implementation Guideline for 5S-CQI-TQM Approaches in Tanzania,” a guideline for disseminating and practicing 5S-KAIZEN-TQM in other hospitals. In 2011, “The Tanzania Quality Improvement Framework in Health Care 2011-2016,” a higher plan to improve quality of hospitals was formulated. TQIF is a framework established to improve quality of healthcare service to be provided continuously, efficiently, fairly and affordably for people. As methods to improve quality, 5S-CQI-TQM is included along with such methods as IPC, Standard Based Management and Recognition, Health Improvement Collaborative. Establishment of QIT and WIT. That these contribute to quality improvement in hospitals has been officially stipulated. TQIF is included as an item to improve healthcare among 11 strategies to enhance provision of healthcare service specified in the Healthcare Sector Strategy III in the country.</p> <p>4) The “5S-KAIZEN-TQM Approach” has been introduced in 55 out of 252 hospitals in the country as of the end of 2012.</p>
	<p><b>【Senegal】</b></p> <p>1) Hospital Reform Programs, “Change 1” and “Change 2” have been conducted since 1998 with support from France. Change 1 was conducted as part of innovation of medical system, aiming at improvement of management capacity in medical staff. Change 2 aims for improving four themes of medical care service – hygiene/ cleanliness, continuous service, patient records, and acceptance – by using the concept of quality management so that quality medical services can be ensured for residents in regions. In the program, a pilot committee is established at a hospital to conduct activities to improve quality based on the theme. The result is monitored by examiners selected from the pilot committee and national follow-up committee.</p> <p>2) The Ministry of Public Health &amp; Social Activities prepared PNDS (Plan national de développement sanitaire 2009-2018). The PNDS is to include 5S method as part of tools to measure quality management in hospitals. Health facilities under jurisdiction of the Ministry of Health (Health Centers and Posts under jurisdiction of Regional Medical Office are not included) will face budget cuts if they do not practice 5S. According to the material, 5S contributes to access to improved quality of healthcare service, decentralization, coordination of national healthcare policy with support from abroad, and stabilization of the culture of management focusing on outcome.</p> <p>3) 5S is to be introduced in all 36 hospitals in the country by April 2013.</p> <p>4) Patients' Bill of Rights, proclaimed by the Ministry of Health, is shown in the sign at the hospital. The intention of the central government is thus recognized in remote areas. Regarding hospital evaluation, framework for a mid-term expenditure plan (CDSMT) was introduced in 2005. From 2008, all regions began to formulate budget and activity plan based on the framework of the predetermined annual activity plan (PTA). Conventional methods to formulate plans according to the components of input were abolished. The concept of “management focusing on outcome” was introduced in order to focus on problems each region faces and goals to be targeted and decide on activities and input.</p>

<p>② Outline of the medical institution (See also Tables 9 and 10)</p>	<p><b>【Tanzania】</b> Five facilities: national, quasi-national, regional and Christian Hospitals in Dar es salaam and regions</p> <p><b>【Senegal】</b></p> <ul style="list-style-type: none"> <li>• A total of three facilities: national hospitals in the Capital Dakar and regions</li> <li>• A total of three facilities: Health Centers<sup>20</sup> and Health Post<sup>21</sup></li> </ul>
<p>③ Main problems specific to the hospital</p>	<ol style="list-style-type: none"> <li>1) Lack of resources is the most serious problem. Shortage occurs in everything from staff, goods to money. <ul style="list-style-type: none"> <li>• Shortage of staff (Tambacounda Regional Hospital, Tambacounda Health Center, Mbeya Region Hospital, Mbeya Consultant Hospital (MCH) )</li> <li>• Pressing finance (Tambacounda Regional Hospital, Tambacounda Health Center)</li> <li>• Shortage of drugs and supplies (MCH)</li> </ul> </li> <li>2) In addition to physically, and hygienically poor hospital environment, hospitals suffer chronic lack of communication/ information and poor service quality. Such situations induce medical accidents and hospital infection. <ul style="list-style-type: none"> <li>• Small waiting rooms and consultation rooms (Tambacounda Health Center, Kotiary, Gaspard Camara)</li> <li>• Untidy hospitals with poor hygiene (Tambacounda Health Center, Kotiary , Gaspard Camara, Mhinbili, Tosamaganga)</li> </ul> </li> <li>3) Lack of trust and poor communication among staff (MCH, Kotiary )</li> <li>4) Claims from patients (Mbalizi )</li> <li>5) Risk of malpractice such as treating wrong patients (Thies )</li> <li>6) Poor service quality (Grand-Yoff)</li> </ol>
<p>④ Motivator for starting 5S</p>	<ol style="list-style-type: none"> <li>1) In many hospitals, the “Program of TQM for Better Hospital Services” was started when senior staff participated in trainings of the “Program of TQM for Better Hospital Services” (including this training), and understood the gist of the “5S-KAIZEN-TQM Approach”. (Tambacounda Regional Hospital, Kotiary Post, Gaspard Camara, MCH, Tosamaganga, Mbeya Region Hospital)</li> <li>2) In another hospital, the program was started when the head of the hospital saw the success in Tambacounda, pilot hospital. (Gaspard Camara)</li> </ol>
<p>⑤ Factors Inhibiting start/ implementation of 5S</p>	<p>Generally, the following 1) and 2) are seen as factors inhibiting implementation at the introduction. Inhibiting factors 3) and 4) occur after the introduction.</p> <ol style="list-style-type: none"> <li>1) Resistance from staff who hate changes in working and work environment (Mhinbili, Tosamaganga, MCH, Mbalizi )</li> <li>2) Busy work schedule due to labor shortage did not allow employees to have time for the activity. (Tambacounda Regional Hospital, Tambacounda Health Center, Kotiary Post, Grand-Yoff)</li> <li>3) Transfer and retirement of staff who underwent training and have enough knowledge of the activity. (Mhinbili, MCH, Mbalizi ,Thies, Tambacounda Health Center)</li> <li>4) Other <ul style="list-style-type: none"> <li>• Doctors reject participation. (Tambacounda Regional Hospital, Mhinbili) (At Tambacounda Regional Hospital, JOCV cleans the office in the place of doctors.)</li> <li>• Some staff members do not understand the textbook written in English or French. (Tosamaganga)</li> </ul> </li> </ol>

<sup>20</sup> Health Centers are secondary medical institutions designated to be established in each Health Region.

<sup>21</sup> Health Posts are primary medical institutions established under the Health Centers.

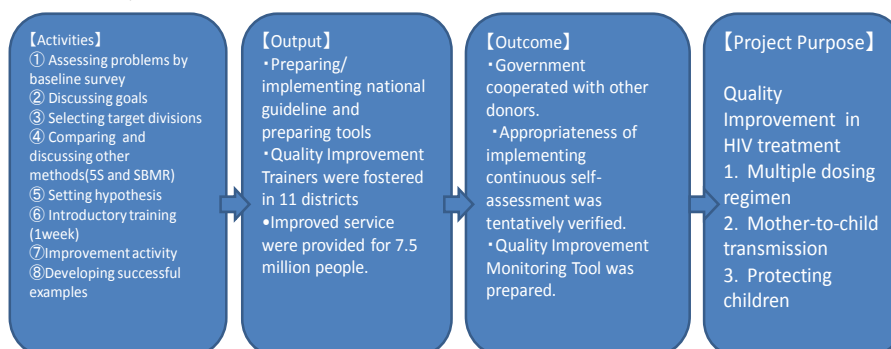
⑥ Content and current status of KAIZEN activities	<p><b>【Tanzania】</b></p> <p>1) While several hospitals have advanced to the stage of KAIZEN activity (MCH), many other hospitals still remain at the 5S level.</p> <p>2) Even hospitals that have advanced to the KAIZEN level find it difficult to adjust among divisions for large-scale KAIZEN that involves different divisions (MCH).</p>
	<p><b>【Senegal】</b></p> <p>1) Gaspard Camara Health Center, Thies Hospital and several other hospitals worked on activities from the introduction of 5S in view of transition to KAIZEN.</p> <p>2) The Ministry of Health commented that 5S is easy, but KAIZEN is difficult.</p>
⑦ Divisions for initial introduction of 5S activities and their selection	<p>1) Instead of starting the activity all across the hospital, hospitals selected a pilot division and introduce a successful example to other divisions.</p> <p>2) There were two opposite reasons for the selection of pilot divisions:</p> <ul style="list-style-type: none"> <li>• Divisions showing understanding and willingness to the introduction (Mhinbili, Tosamaganga, MCH)</li> <li>• Divisions that the hospital considers problematic (Mbeya Region Hospital, Mbalizi, Tambacounda Regional Hospital)</li> </ul> <p>Other reasons selected by a small number of hospitals include:</p> <ul style="list-style-type: none"> <li>• Intentionally select divisions unwilling to introduce or with low motivation (MCH)</li> <li>• Start in tandem with recycling unnecessary goods (Thies )</li> </ul>
⑧ Activities of Head of Hospital	<p>The following activities were conducted by the head of hospitals, which are considered important in the domestic survey.</p> <ol style="list-style-type: none"> <li>1) Convince resistant power. (Mhinbili)</li> <li>2) Explain the importance of the activity to hospital staff. (MCH, Gaspard Camara)</li> <li>3) Approve budget for the activity (Mbalizi, Mbeya Region Hospital, Thies)</li> <li>4) Convene regular meetings. (Mbalizi, Tambacounda Health Center)</li> <li>5) Supervise/ follow up activities. (Tambacounda Regional Hospital, Gaspard Camara, Grand-Yoff, Tosamaganga)</li> <li>6) Join committee meeting organized by local residents to ask for cooperation. (Gaspard Camara, Kotiary)</li> <li>7) Proactively practice 5S activities to be a role model. ( Kotiary )</li> </ol>
⑨ QIT activities	<p>The following activities were conducted by QIT, which were considered as important as the activities of Head of Hospital:</p> <ol style="list-style-type: none"> <li>1) Convene regular meetings. (Tosamaganga MCH, Mbalizi, Thies, Tambacounda Regional Hospital, Tambacounda Health Center)</li> <li>2) Supervise activities conducted by WIT. (Mhinbili, Mbeya Region Hospital, Gaspard Camara, Thies, Grand-Yoff)</li> <li>3) Organize in-hospital competition and award excellent divisions. (Mhinbili, Tosamaganga, MCH)</li> <li>4) Staff training (Tosamaganga)</li> </ol>
⑩ Activities and Outcomes	<p>The following specific activities brought about many outcomes on site.</p> <p><b>【Activities】</b></p> <ol style="list-style-type: none"> <li>1) Organize/ sort equipment and stationery. (All hospitals)</li> <li>2) Organize/ sort inventories and supplies in warehouse. (All hospitals)</li> <li>3) Establish rules for places to store medical equipment and label the equipment. (Mhinbili, MCH, Tosamaganga, Mbalizi, Gaspard Camara, Grand-Yoff, Tambacounda Regional Hospital, Tambacounda Health Center, Thies)</li> <li>4) Post maps, signs, and posters to show locations of departments and hospital policies. (All hospitals)</li> <li>5) Color-code trash cans according to the types of wastes. (Mbalizi, MCH, Mbeya)</li> </ol>

	<p>Region Hospital, Mhinbili, Grand-Yoff, Tambacounda Regional Hospital)</p> <p>6) Reuse waste materials. (Mhinbili, Mbalizi, Mbeya Region Hospital, Thies, Tambacounda Health Center)</p> <p>7) Standardize the process of 5S activities among departments in the hospital. (Mhinbili)</p> <p>8) Clean the hospital by involving local residents. (Kotiary)</p> <p>9) Install a box to collect comments from patients. (Kotiary, Mbalizi, Tambacounda Regional Hospital, MCH)</p> <p>10) Improve the system for patient records. (MCH)</p> <p><b>【Outcomes】</b></p> <p>1) Reduction of wasteful time spent on finding things. (Mhinbili, Gaspard Camara, Tosamaganga, Mbeya Region Hospital, Mbalizi)</p> <p>2) Reduction and recycle of unnecessary items. (Thies, Gaspard Camara, MCH, Mbeya Region Hospital)</p> <p>3) Reduction of missing items. (MCH)</p> <p>4) Hospital information maps that are easier to follow. (Mhinbili, Tambacounda Regional Hospital, Thies, Gaspard Camara, Mbalizi)</p> <p>5) Ensured extra space. (Tambacounda Health Center, Mhinbili, Tosamaganga, Mbalizi)</p> <p>6) Improved hygiene environment. (Tambacounda Regional Hospital, Tambacounda Health Center, Thies, Gaspard Camara, Mhinbili, Mbeya Region Hospital)</p> <p>7) Reduced waiting hours for patients. (Tambacounda Regional Hospital, Tosamaganga, Mbeya Region Hospital)</p> <p>8) Enhanced safety for staff. (Tambacounda Regional Hospital, Tambacounda Health Center, Mbeya Region Hospital, Mbalizi)</p> <p>9) Reduced risk of treating wrong patients. (Thies)</p> <p>10) Reduction of the cost of inventory by 5S (reduction of excessive/ expired inventory). (Mhinbili, Mbalizi, Mbeya Region Hospital, Thies, Tambacounda Health Center, MCH)</p> <p>11) Income increased thanks to the reduction in the number of unapproved applications for medical insurance deduction due to recycled and inappropriate documentation. (Gaspard Camara, Thies, Tosamaganga, MCH)</p> <p>12) Shared concept of work (Thies)</p> <p>13) Positive and favorable change seen in attitude and behaviors of staff. (Tambacounda Regional Hospital, Thies, Mhinbili, Tosamaganga, MCH, Mbalizi, Grand-Yoff)</p> <p>The following is a table to summarize the relationship between activities and outcomes shown above.</p> <p>Most outcomes were expressed as a result of several activities. On the other hand, one activity resulted in several outcomes.</p> <p>For example, the activity “Organize/ sort equipment and stationery” affected commonly on the outcomes 1), 2), and 3). It demonstrates that 5S activity has a complex logic in emergence of effects.</p>
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(Reference : relationship between activities and outcomes at each hospital)	
<Outcome>	<Activity>
1) Less time for looking for items	← Set and sort of instrument and items S1,S2 Set and sort in warehouses S1,S2
2) Decrease or recycle of wastes	← Set and sort of instrument and items S1,S2 Set and sort in warehouses S1,S2 Recycle of wastes S2
3) Decrease of lost items	← Set and sort of instrument and items S1,S2 Set and sort in warehouses S1,S2
4) Visual signs in hospitals	← Clear notices of maps and policies S4,S5
5) Creation of new space	← Set and sort in warehouses S1,S2
6) Improvement of hygiene	← Color-coding of dust boxes S3 Hospital cleaning with local residents S3
7) Shorter waiting time of patients	← Set rules and indicate original position of tools S4 Clear notices of maps and policies S4,S5
8) Improvement of safety for staffs	← Color-coding of dust boxes S3
9) Less risk for confusion in treatments	← Clear notices of patient information S4,S5
10) Less inventory cost	← Set and sort in warehouses S1,S2 Recording inventory status S4,S5
11) Increase of income	← Improvement of recording patient information S2
12) Share of hospital concept by staffs	← Clear notices of hospital policies S4,S5 Common 5S process in a hospital S4 Hospital cleaning with local residents S3
13) Change in attitude or actions of staffs	← Place a box to collect patients' voices S5 Clear notice of hospital policies S4,S5
⑪ Factors for promotion by implementing the "5S-KAIZEN-TQM Approach"	<p>The following factors for promotion were confirmed by the on-site survey (or by the interview):</p> <ol style="list-style-type: none"> <li>1) Top's strong leadership (Gaspard Camara, MCH, Grand-Yoff, Kotiary)</li> <li>2) Installation/ energetic activities of QIT (all hospitals except for Kotiary)</li> <li>3) Supervision by Ministry of Health and Regional Medical Offices (Tambacounda Regional Hospital)</li> <li>4) Introduction was easy because the habit of cleaning had been established in the hospital. (Thies )</li> <li>5) As the hospital experienced other programs by other donors, staff had a high awareness of improvement. (MCH, Mhinbili, Tosamaganga, Mbeya Region Hospital, Grand-Yoff, Gaspard Camara, Tambacounda Region Health Center)</li> <li>6) Evaluation/ request of activities in the hospital by media and local residents heightened the motivation. (Gaspard Camara, Kotiary)</li> <li>7) Lack of knowledge and labor was mitigated by the input of JOCV. (Tambacounda Regional Hospital, Kotiary Post, Thies, MCH)</li> </ol>
⑫ Collaboration with other donors; presence/ absence of synergy	<p><b>【Tanzania】</b></p> <p>The following three kinds of support were given by donors in the local medical field.</p> <ol style="list-style-type: none"> <li>1) IPC (hospital infection control) program IPC is a program conducted for local hospitals by Tanzania, the Ministry of Health, and JHPIEGO. JHPIEGO is a donor sponsored by USAID. Among hospitals surveyed, four hospitals except for Mbalizi Hospital experienced the program. Among components included in IPC, the following two indicators are used in the components of "Efficiency" and "Safety."<sup>22</sup> <ol style="list-style-type: none"> <li>① Efficiency : Rate of utilization of flowchart in treating malaria</li> <li>② Safety : Confirm whether HIV test is conducted 100% of the time before</li> </ol> </li> </ol>

	<p>blood transfusion by using laboratory test records. According to Mbeya Region Health Bureau, in December 2012, training was conducted in combination of IPC and 5S. This program is widely conducted in Tanzania and all across Africa.</p> <p>2) Quality management component in the "Tanzania-German Program Support for Health" (TGPSH) by GIZ</p> <p>The four themes of support are: 1) HIV, 2) Capacity Building, 3) Financing the health sector, and 4) Decentralization in the health sector.</p> <p>The support provided in the Mbeya Region is financial support for training and assessment for seven public hospitals and eight Face-based hospitals.</p> <p>3) Support for Improvement of the quality of care in the field of HIV by University Research Co., LLC (U.R.C)</p> <p>U.R.C is a non-governmental organization (NGO) that started its activity in Tanzania in 2007, and provides support to improve the quality of care in treatment of HIV (ART: Antiretroviral therapy, PMTCT: Preventing Mother-to-Child Transmission, HBC: Home Based Care) in regions across the country. The organization is funded by the US President's Emergency Plan For AIDS Relief (PEPFAR).</p> <p>This program conducts activities with the goal of improving the quality of care in treatment of HIV. The survey did not clarify all the causal relationships between output and outcome of the activities in this program. However, successful cases at individual hospitals were introduced in other facilities through an involvement of competent authorities. The outcomes included fostering human resource and preparing tools for the introduction.</p> <p>The measurement indicators selected are roughly divided in three categories: Indicators regarding access of patient to medical service; Indicators to measure continuation of quality improvement; Indicators based on human health.</p> <p>As points to consider in implementing the program, the importance of the following are pointed out: coordination with higher policies; implementation of the project based on the problems that local health facilities face.</p>
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(Reference) Logic of the program to support quality improvement in HIV treatment by U.R.C



**【Points to note in implementing the project】**

- Project should be consistent with higher policies.
- It is necessary to understand the environment that surrounds medical facilities such as shortage of medical staff, vulnerable drugs distribution, poor access to local facilities, and shortage of devices/ apparatuses.

**【Indicators】**

① Access Indicator  
Indicator for patients’ access to medical service where patients can receive proper information and appropriate treatment

② Retention Indicator  
Indicator such as staff turnover at hospitals to measure continuous quality improvement

③ Well-being Indicator  
Indicator based on human health such as morbidity, status where it is unlikely to get ill and early healing

**【Senegal】**

The following two support programs in the medical field were confirmed by the on-site survey. Here the logic of the program conducted by FHI was analyzed.

1) Hospital Innovation program ”Change 2”

Details are explained in the following section (12) “Positioning of the “5S-KAIZEN-TQM Approach” in government policy.” The Grand-Yoff Hospital, which we visited for the survey, also conducted this program.

2) ”HIV and Tuberculosis Program” by the Family Health International (FHI)

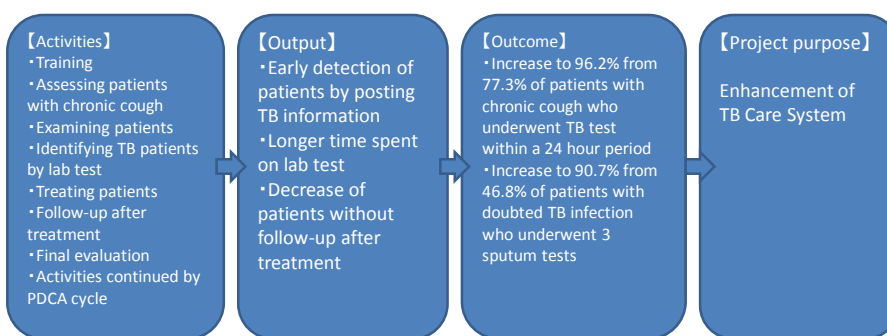
FHI is an NGO funded by USAID. This program aims at prevention of HIV and tuberculosis infection. The material of this program shows examples of health facilities that introduced Quality Improvement (QI) to enhance the tuberculosis care system.

The program was conducted at both Tambacounda and Gaspard Camara Health Centers.

The QI sets the goal and its outcome indicators, then conducts activities to achieve the goal according to the PDCA cycle.

This program forms a logic with the goal to enhance care system for tuberculosis infection, seeking problem solving at individual facilities. The program was started in a small scale at a unit level, and its success was developed in other units.

(Reference) Logic of the program to enhance tuberculosis care system by FHI



**【Problems in implementing the project】**

- Establishing the monitoring system took time. (Preparation of one-dimensional database on PC)
- Those involved stopped sharing measured data due to lack of shared awareness of quality improvement.

**【Lessons learned from implementing the project】**

- Keys to success are leadership and sense of concern of those involved at each level.
- Consideration of local context is necessary for implementing the project.
- Ownership will not be fostered without consensus formed in the field.

- Previously, halfway in this program, measured data were not shared among those no longer involved in some cases. Thereafter, the program has made efforts to foster local ownership, continue the activity, and involve relevant persons on site.
- The project pointed out the necessity of commitment of the Ministry of Health in order to ensure continuation and disseminate in other facilities.
- FHI, as interviewed, stated that QI and KAIZEN are similar in that they are both voluntary method for problem solving based on PDCA. It also pointed out that concept and skills of 5S should be mastered by local staff before introducing QI in order to improve work environment and raise awareness of staff, and that 5S has a huge synergy effect with QI.

Example indicators in QI by FHI

Indicators	Method to measure indicators
1. Ratio of patients with chronic coughing referred from the Health Post who underwent the first sputum test within 24 hours	Measurement by the date of patient information given by the Health Post
2. Ratio of tests of which at least 95% was accurately diagnosed by staff	Result of tests quarterly reported by national test organizations
3. Ratio of treatments started in all patients on the day when the result was given	Number of patients who was started with treatment on the same day divided by the total number of patients who underwent medical practice

⑬ Other (regional characteristics)

- 【Tanzania】**
- 1) Some said that a Swahili version of the textbook was necessary to disseminate the “5S-KAIZEN-TQM Approach” in Tosamaganga.
  - 2) Staff from GIZ pointed out, “Remoteness should be taken into consideration since many local residents cannot go to health facilities because of the poor traffic access and travel expenses, successful cases in pilot hospitals could be adopted in communities.”



	<p><b>【Senegal】</b></p> <p>1) Some regions have a low rate of enrollment in primary education. Dissemination in such regions seems difficult.</p>
⑭ Other (Hospital finance)	<p><b>【Senegal】</b></p> <p>The Ministry of Public Health &amp; Social Activities commented as follows regarding finance. Each hospital faces pressing finance which could be an obstacle for disseminating the activity.</p> <p>1) All public hospitals are operated in the red.  2) Government budget has not been given to renew equipment since 2005.  3) The goals are rational management by utilizing existing resources in order to get out of the red, and provision of service that satisfies 90% of patients.</p> <p><b>【Tanzania】</b></p> <p>1) Faith-based hospitals are financially more stabilized than public hospitals, and rarely have such problems as delayed payment of salary to staff.  2) Public hospitals suffer from budget shortage in addition to shortage of labor and facilities. Thereby, training of their own cannot be sufficiently conducted.</p>

### 2.3.3 Verification of the four hypotheses based on the on-site survey

This Chapter concludes with the result of verification of the four hypotheses based on the on-site survey, limiting to the “5S-KAIZEN-TQM Approach” in the project.

**【 Hypothesis 1 : Main issues specific in individual hospitals and the process of solution for them may not be clearly reflected in the project design (project purposes, outcomes, and indicators, etc.) .】**

Hypothesis 1 reflects the local situation in general.

Main problems specific to the hospital converge on ① frequently occurring medical accidents, ② frequently occurring hospital infections, ③ lack of such resource as labor, goods and money, ④ poor service quality, and ⑤ lack of organizational capacity.

The “Program of TQM for Better Hospital Services” intends to solve these main problems with the “5S-KAIZEN-TQM Approach”. In order for the “5S-KAIZEN-TQM Approach” to function effectively, it is necessary to set appropriate project purposes and indicators to measure outcomes.

In each facility we visited, the 5S activity checklist and outcome of direct improvement in hospital environment (organizing, sorting, and cleaning) are used for outcome indicators. However, basic information on hospital infections and medical accidents, main problems, could not be obtained. Financial data, basic data on labor, goods and money were submitted to the survey team by only a few hospitals.

Some point out that this partly reflects local culture’s “unrecorded culture.” However, it is necessary to ensure an environment and tools to procure necessary indicators, and establish a framework to appropriately reflect them in the project design.

Seeing this from a different viewpoint, the importance of these indicators needs to be logically demonstrated in the project design. Thus, in order to solve main problems at each hospital, it is necessary for the project design to show the process that the “5S-KAIZEN-TQM Approach” can provide.

**【 Hypothesis 2 : There are factors that disturb development from 5S (environmental renovation in hospital) to KAIZEN (renovation in work processes, etc.) . 】**

In many hospitals, there are factors that disturb development. Several advanced hospitals progressed to the level of KAIZEN. Still most hospital still remains in activities at the 5S level. Transition to KAIZEN by every hospital is expected to take more time.

In the result of the on-site survey, many hospitals achieved quite a lot of outputs and outcomes associated with 5S activities. Activities at the 5S level are steadily developed. However, a responsible person from the Ministry of the Health commented, “KAIZEN is difficult.” KAIZEN is just started by advanced hospitals.

In Tanzania, a practical guidebook on 5S-KAIZEN used in Senegal health care system management enhancement project consists of understandable descriptions about the effect before and after the introduction of 5S with the use of photographs, while explanation on KAIZEN is relatively little and seemed to contain relatively few specific descriptions such as examples of implementation. Such content of the textbook may make one feel KAIZEN difficult.

**【 Hypothesis 3 : Consistent involvement of all who are concerned in hospital from the start of activity is associated with continuation of 5S-KAIZEN-TQM activities (insufficient involvement has an impact on continuation.) . 】**

This hypothesis is not necessarily appropriate since in many cases of the survey target project, there is no involvement of the entire hospital personnel in a consistent manner from the start of the activities and the majority is able to expand and continue the successful case into other department by selecting and introducing partial department as pilot. According to the on-site survey, practically no hospitals involved all staff from the beginning of the activity, but activities were continued in some form at each hospital.

As an exception, at such facilities in a very small scale as Health Center and Health Post in Senegal, it turned out that all staff participated from the beginning.

From the local interviews, many said that:

- ① Top management and QIT play an important role in continuation of the activity;
- ② 5S can be continued even if doctors do not participate from the beginning.

**【 Hypothesis 4 : When deploying the scenario, “From establishing 5S pilot hospitals to disseminating all across the country by the Ministry of Health”, the lack of inspection of the results and of input resource for the “5S-KAIZEN-TQM Approach” at pilot hospitals are bottlenecks of the deployment. 】**

We could see the possibility where the lack of involvement of the Ministry of Health was a bottleneck when developing all across the country.

Specifically, the following cases were observed.

Success in pilot hospitals where the activity was voluntarily started in Tanzania and Senegal, the activity was spread all across the countries through such efforts as developing implementation guidelines by the Health and Welfare Ministry or implementing the instructional visits from the ministry.

On the other hand, it might be a rare case, but at Gaspard Camara Health Center, the head of the center participated in training, observed other successful hospitals, and voluntarily started 5S. This is because 5S and KAIZEN activities require little cost and input. 5S activity is considered to be easy to start, and achieve visible effect in a short period at an early stage.

However, it seemed necessary for the Ministry of Health to provide support for dissemination across the country by securing budget for training and sharing information on successful cases.

## 2.4 Logic of the “5S-KAIZEN-TQM Approach” based on the on-site survey

How problems were solved by using 5S and KAIZEN at each hospital is summarized according to the logic of each hospital. Explanation is given using a case in Senegal. (See Tables 12-16). Here, refer to Table 8 for the characteristics of each hospital.

(1) Logic in the “5S-KAIZEN-TQM Approach” in Senegal’s Tambacounda Regional Hospital (Refer to Table 12)

At Tambacounda Regional Hospital, visions and missions were posted in the hospital to clarify the goals for staff to aim at. Through the 5S activity, QIT etc. was established, and the award system was introduced. These are outcomes seen as raised awareness of each staff members and organizational efforts. Direct outcomes of 5S activity are seen as improved hospital environment, improved work efficiency, and better service.

As preconditions of these outcomes, involvement of top management and doctors as well as training of staff is mentioned. Inhibiting factors include busy work schedule and difficulty in involving doctors. Divisions with relatively few patients can easily participate in the activity. Promoting factors include hospital evaluation by regional Medical Office and successful experience that motivates staff.

**Table 12 Logic of Tambacounda Regional Hospital in Senegal**

	Logic		Remarks	
Input	(Input from outside)		Pre-conditions	1.Positive attitude of the management 2.Personnel could identify their problems in advance, 3. Training to personnel 4. Evaluation system 5. Participation of doctors
	1) Participation in AAKCP 2) Participation in “Change2” 3) Understanding a way of problem analysis 4) Staff’ experience of improvement 5) Support by JOCV 6) Subsidy from the government 7) Evaluations and trainings by JICA project 8) Outsourced cleaning			
Activity	1-1.Survey of patient satisfaction 1-2.Self-evaluation in 5S 1-3.Rewarding to 5S activities 2-1.5S initial training 2-2 Preparation of an action plan . 2-3. Establishment of QIT/WIT3-1. Notice the policy in	1-1.Re-paint walls 1.2.Outsource a part of cleaning activity 1.3.File color-coding 1.4.Cleaning activity by JOCV in an office 2-1.Preparation of carts to bring tools 3-1.Preparation of billboards 3-2.Numbered chairs at the waiting room to identify the number of waiting patients	Obstacles	1. Lack of financial resource 2.Lack of qualified personnel

	billboards 3-2. Promotion of the patent right charts 3-3. Setting a “5S corner” 3-4. Preparation of an assignment list	3-3.Preparation of a box for emergent cases in the maternity unit 3-4. Filling potholes in the patio 4-1.Coloer-coded dust boxes 5-1. recycled boxes for used injection needles 5-2. Separation of used oxygen bottles		
Outcome (Short-term)	1. Motivation for improvement 2. Problem solving mind-set 3. Share information among staff	1. Orderliness 2. Time-saved 3. Improving the reception service 4. Better hygiene and safety 5. Recycled materials	Facilitating factors	1. Strong implication of MoH and Regional Medical Office 2.Efforts for improvement exist. 3. Staff are motivated. 4.Less patients in the department (Ophthalmology)
Outcome (Long-term)	a. Increasing sense of responsibility of staff (Short term 1,2) b. Share information of policy and patient rights (Short term3)	a. Each dept. develops its positive attitude motto (Short term 2,3,5) b. Patient satisfaction (Short term2,3,4) c. Efficiency in works (Short term 1,2)	Constraints	1. Reluctance of medical doctors for participation 2. More patients in the department (Maternity)
Goal of the hospital	< Vision > Offering quality service with less cost < Mission > 1.Provide diagnosis, Supervision, Treatment of patients and pregnant women. 2.Guarantee to all equitable access to preventive, curative, and rehabilitation services 3.Education, continuing education, research, actions for preventive medicines and health promotions < Value > Availability (of the services) / Security / Satisfaction		Remarks	1. 5S was disseminated to all depts. by 2009. 2. Consequences: of 5S-KAIZEN-TQM efforts are justified, and the personnel made responsible for the quality services. 3. Frequent change of Director of the hospital (5 times since 2007) 4. Illiteracy

(2) Logic in the “5S-KAIZEN-TQM Approach” in Senegal’s Thies Regional Hospital (Refer to Table 13)

Thies Regional Hospital engaged in 5S with the goal, “Reduce medical risks such as treating wrong patients.” In an effort for 5S activity, such outcomes as improved work flow, and enhanced database, which were equivalent of KAIZEN, were also observed. Staffs were highly aware of utilizing limited resources, and recycled/ sold unnecessary items to raise profit. These were outcomes regarding hospital management. In the hospitals, although having a large number of beds and staff, a 5S implementation team consisting with members selected from each division proactively promote the activity. At the same time, the 5S implementation team recognizes it necessary to establish the method of evaluation to evaluate 5S activity by itself, and promoting discussions for that purpose.

**Table 13 Logic of Thies Regional Hospital in Senegal**

	Logic		Remarks	
Input	(Inputs from outside) 1) Training by JICA 2) Financial support by JICA to equipment installation 3) Monitoring & evaluation by JICA 4) Financial support by the World Bank 5) JOCV (4 times) 6) External evaluation by MoH (Inputs by the hospital) 1) Budget for each dept. 2) QIT 3) Jackets for the 5S committee		Pre-Conditions	1. Leadership 2. Recognition of challenges by the hospital in advance 3. Initial training to staff 4. Evaluation system 5. Involvement of doctors
Activity	1-1. Initial trainings to all the staff 1-2. Overall analysis of the present situation 1-3. Action plan of 5S 1-4. 5S teams in all the depts. 1-5. Establishment of 5S committee and WIT 1-6. Pilot activity at the maintenance dept. for 1 year	1-1. Organizing files 1.2. Labeling in items 1.3. Patients and their location identification 2-1. Entire clean-up operation by all the staff 3-1. Signalization (Maps) 4-1. Mission statement 5-1. Inputting information of wastes in database 5-2. Recycle and sale used goods 6-1. Work chart	Obstacles	1. No 5S evaluation system nor patient satisfaction evaluation 2. Change in the director's position and in the committee members
Outcome (Short-term)	1. Overall staff commitment 2. Awareness of the situation 3. Activated 5S activity	1. Less time wasted and risk reduced 2. Clean facility 3. Better reception 4. Sharing information 5. Recycling 6. Maintain the quality service	Facilitating factors	1. Communication with MOH, other regional offices, and donors. 2. Existing clean-up activities 3. Successful experience drove staff members' motivation 4. Recognition of lack of resource
Outcome (Long-term)	a. Increasing sense of responsibility of staff (short term 1,2) b. Integration of 5s into own jobs (Short term 3)	a. Positive changes in behavior (Short term 2,3,4,5) b. Patient satisfaction (Short term 1,2,3,6) c. Efficiency in works (Short term 1,6)	Constraints	1. Change in the director's position
Goal of the hospital	<Overall goal> 1. Risk reduction 2. Improve safety 3. Patient safety 4. Biomedical waste management  <Goals gained by 5S> 1. Development of 5s evaluation 2. Establish procedure to measure the evolution 3. Clear role of responsibility of staff 4. Population related to 5S		Remarks	1. Starting 5S from a maintenance dept. as a pilot in 2010. 2. Shelves were made from recycled materials and some waste were sold. 3. Frequent change could be an obstacle 4. There is a self-monitoring system, but still in process to set a measuring process and its indicators

(3) Logic in the “5S-KAIZEN-TQM Approach” in Senegal’s Gaspard Camara Health Center (Refer to Table 14)

While there is still little experience in 5S activities six months after the implementation of 5S at Gaspard Camara Health Center, what has been characteristic there is the high level of leadership that is being displayed, such as the director personally taking the initiative in adopting 5S. With 98 staff members, the institution is small in scale and the health care supervisor frequently visits sites in person to confirm the progress of 5S activities, and has the deep respect of the staff. Six months after the start of 5S activities, the reputation of the institution has been enhanced among local residents, and its activities have been picked up by the media. These types of ratings by external sources have tied in to the upholding of motivation among the staff who have shown that they have strong desires to also disseminate 5S to other health centers in the region.

**Table 14 Logic of Gaspard Camara Health Center in Senegal**

	Logic		Remarks
Input	(Inputs from outside) 1) 3-days training by JICA (PARSS <sup>23</sup> ) 2) Financial support by FHI 3) Participation in the Internal evaluation workshop by the chief doctor 4) Observation in the Tanbacounda Regional Hospital by the chief doctor 5) Instruction by PARSS  (Input by the center) 1) Financing from the health committee 2) Establishment of QIT and WIT		Pre-Conditions 1. Leadership style (cooperation among people, inspiring, close to staff, practical) 2. Recognition of challenges in advance 3. Training to staff 4. Evaluation system
Activity	1-1. 3-days training to pilot depts. 1-2. 5S activity with the involvement of the health committee 2-1 Pilot depts. were the admin. and warehouses 2-2. QIT trained the staff in each dept. 3-1. Suggestion box to collect patients’ voice 3-2. Regular meetings with the health committee	1-1. Organizing files in computers 1-2. Labeling to goods 1-3. Organizing the working spaces 2-1. Cleaning the inside / outside of the center. 3-1. Signalization (Maps, etc.) 4-1. Notice 5S activities in billboards 5-1. Recycle and sales of used materials	Obstacles 1. Lack of technical support by the ministry 2. Lack of financial resource for 5S 3. Few opportunity for staff training
Outcome (Short term)	1. Understanding of 5S by all the staff 2. Activated 5S activity 3. Staff members’ motivation	1. Less time wasted and less errors 2. Clean facility 3. Improvement of service at the reception 4. Sharing more information among staff 5. Recycling	Facilitating factors 1. The center’s position as the referral center 2. Good communication among depts. 3. Geographical factor (in Dakar) 4. Recognition in the limited resources 5. High motivations of staff by interviews from media or appreciations from patients

<sup>23</sup> Project for Reinforcement of Health System Management in Tambacounda and Kedougou

Outcome (Long-term)	<p>a. Increasing sense of responsibility of staff (short-term2,3)</p> <p>b. Integration of 5s into own jobs (Short term3)</p> <p>(These outcomes are expected ones because they have just started 5S)</p>	<p>a. Positive mind-set (Shortterm2,3,4,5)</p> <p>b. Patient satisfaction (Shortterm1,2,3)</p> <p>c. Efficiency in works (Shortterm1,2)</p>	Constraints	<p>1. Exodus of poverty to the urban area which causes the increase of patients</p> <p>2. Financial limit to spread 5S (to get a car)</p>
Goal of the hospital	<p>1.Satisfying the patients</p> <p>2.Offering better service</p> <p>3.Spread 5S to the districts</p> <p>4.To be a model center to contribute to reach MDG (Millennium Development Goal)</p>		Remarks	<p>1. This center started 5S last year.</p> <p>2. High motivation of staff by interviews from media which dealt with their 5S activity</p> <p>3. Increase of the number of patients which has brought more income</p>

(4) Logic in the “5S-KAIZEN-TQM Approach” in Senegal’s Tambacounda Health Center (Refer to Table 15)

This center is a site that has been a subject for JICA’s Project d’Appui au Renforcement de Systeme de Sante, or the Project for Reinforcement of Health System Management. One of the objectives for implementing 5S had been to resolve issues concerning the reduction of deficit, which is an aspect of hospital management. This center has been allocating costs for conducting 5S activities, increasing the number of staff and purchasing the necessary equipment.

**Table 15 Logic of the Tambacounda Health Center in Senegal**

	Logic		Remarks	
Input	<p>(Inputs from outside)</p> <p>1) 3-days training by JICA (PARSS)</p> <p>2) Technical support from MOH</p> <p>3) Rewarding to 5S activity by MOH and JICA</p> <p>4) New Chief who aims at revitalizing 5S</p> <p>5) Evaluation by Regional Health Service</p> <p>(Inputs by the center)</p> <p>1) Advice from a Health Education Director (5S rewarded)</p> <p>2) Establishment of QIT and 5S sub-committee</p> <p>3) Additional staff for 5S activity</p> <p>4) Purchase of tools for 5S implementation</p>		Pre-Conditions	<p>1. Positive involvement by the chief (Leadership)</p> <p>2. Recognition of challenges in advance</p> <p>3. Training to staff</p> <p>4.High motivation of staff</p>
Activity	<p>1-1. All the staff joined in a training</p> <p>1-2. Establishment of 5S sub-committee</p> <p>1-3. Action plan per each dept.</p> <p>1-4. Monthly follow-up by the chief</p> <p>1-5.Training to heads of depts.</p> <p>1-6. Evaluation by MOH and the health</p>	<p>1-1. Organizing files</p> <p>1-2.Labelling to goods</p> <p>1-3.Organizing telephone codes</p> <p>2-1. Cleaning working spaces</p> <p>2-2. Installing lights / lamps</p> <p>3-1.Signalization (Maps, etc.)</p>	Obstacles	<p>1. Lack of financial resources for 5S activity</p> <p>2. Lack of materials for 5S</p> <p>3. Narrow space</p> <p>4. Lack of qualified personnel</p>

	committee			
Outcome (Short-term)	1.5S understanding by all staff 2. Vitalization of 5S 3. Improvement of staff members' motivation	1. Less time wasted and prevention of errors 2. Clean atmosphere 3. Improvement of the service in the reception	Facilitating factors	1. Infrastructures donated by French and Spanish donors 2. Experience of the HIV-prevention program held by the Ministry. 3. Advices from a director of the health education dept.
Outcome (Long-term)	a. Increasing sense of responsibility of staff (Shortterm2,3) b. Integration 5S into own jobs (Shortterm1,2,3)	a. Improvement of working atmosphere (Shortterm1,2) b. Patient satisfaction (Shortterm1,2,3) c. Efficiency in works (Shortterm1,2)	Constraints	1. Less time for 5S due to treatments to many patients 2. Difficulty in doing follow-up by the staffs themselves. 3. Strikes by nurses
Goal of the hospital	1.Improvement of the quality of the health service 2. Reduction of the deficit		Remarks	1. This center started 5S last year. 2. The project site of the JICA's "Reinforcement of Health System Management" 3. The new chief revitalized the 5S activity

(5) Logic in the “5S-KAIZEN-TQM Approach” in Senegal’s Kotiary Health Post (Refer to Table 16)

The Kotiary Health Post is a site which is a subject for JICA’s Project for Reinforcement for Maternal and New Born Health Care. The head of the post has identified humanitarian health care services for expectant and nursing mothers as an issue that it faces, and had been making efforts to improve the standards of health care through 5S and KAIZEN. The number of staff, which includes the nurse who heads the Post, is seven, and there are no doctors at the facility. As this is a small facility and the system in place at the organization is flat, activities were being undertaken by all members of staff.

**Table 16 Logic of the Kotiary Health Post in Senegal**

	Logic		Remarks	
Input	(Inputs from outside) 1) Chief’s participation in a training in Japan 2) Materials donated by JICA 3) JOCV (a nurse) 4) Budget from the health committee 5) A manual provided by PRESSMN 6) Set-tasks (weekly cleaning with local residents)  (Inputs by the post) 1) Sharing 5S information by the chief nurse 2) Sales profit distributed to 5S activity 3) Purchase of materials for 5S		Pre-condition	1. Positive involvement of the chief nurse 2. Recognition of challenges in advance 3. Training to staff 4. Motivation of staff
Activity	1-1. All the staff understand 5S 1-2. 5S committee	1-1. Starting from 3S 2-1. Set-task 3-1. Set a bench in a waiting space	Obstacles	1. Small number of staff (7 staff) 2. Mistrust among staff 3. Working almost 24 hours because of the demands from residents



		4-1. Signalization of the policy of the post 4-2. Health information in billboards and promotion to a community		
Outcome (Short-term)	1.5S understanding by all staff 2. Vitalization of 5S 3. Improvement of staff members' motivation	1. Less time wasted and prevention of errors 2. Clean atmosphere 3. Improvement of the service in the reception 4. Sharing information among staff	Facilitating factors	1. High expectation from the authority 2. Responsible position of the nurse 3. Resourcefulness (Network) of the chief nurse
Outcome (Long-term)	a. Increasing sense of responsibility of staff (Shortterm2,3) b. Integration 5S into own jobs (Shortterm1,2,3)	a. Improvement of working atmosphere (Shortterm1,2) b. Patient satisfaction (Shortterm1,2,3) c. Efficiency in works (Shortterm1,2)	Constraints	1. Large coverage of health area 2. Remoteness 3. Lack of staff and medical tools
Goal of the post	Humanized health service		Remarks	1. Small and flat organization which enabled initial activity with all staff 2. Project site of PRESSMN

Based on these conditions and using the items that are seen present as common denominators among each of the respective hospitals as the basis, we created the logic, comprising implementation through outcomes (See Figure 5).

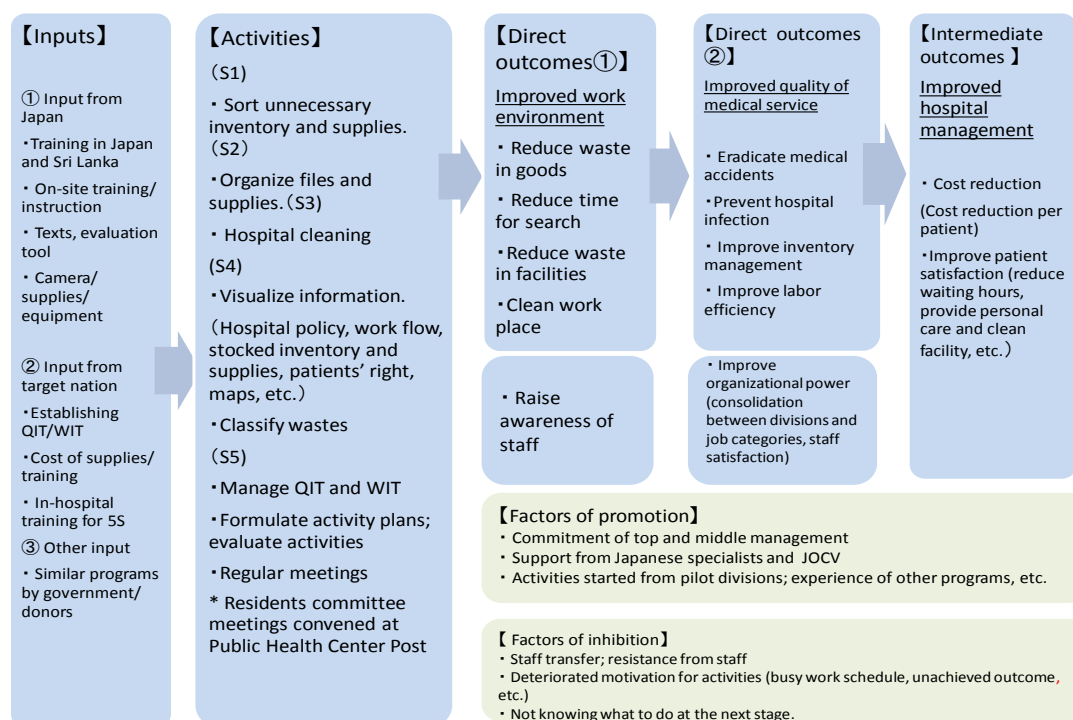


Figure 5 Logic for Projects Conducted at Hospitals in Senegal and Tanzania

We conducted our research by filling in each of the items seen in the logic as presented in Diagram 2, based on interviews with the relevant persons at the respective local hospitals. In doing this, we gained an understanding of the following points:

- As direct outcomes of 5S activities, there have been reductions in the excess that is often found lurking in the workplace, and a clean workplace, an outcome that concerns the improvement of the work environment, has been achieved.
- These activities and direct outcomes are similar at almost all hospitals, and their details seemed to be influenced by the content of the 5S text. Some creative efforts were observed in some part such as the creation of a “5S Corner” in the Tambacounda Health Center.
- As an intermediate outcome of 5S and KAIZEN, improvements have been achieved in the quality of health care services, and their outcomes have been linked to improve business indicators.

### **Column 2. Case Study of the Tanzania Mbeya Consultant Hospital**

In 2007, the 5S-KAIZEN-TQM got underway on the occasion of the hospital director’s participation in a “Program of TQM for Better Hospital Services”. Prior to this implementation, the hospital had faced issues such as a lack of sharing within the institution on its concepts concerning the quality of health care, or the theft of certain items. Considering that this approach might be effective in resolving these issues, the hospital director convinced management of the importance of these activities, while also taking voluntary and continuous actions for involvement, such as the hosting of weekly meetings and setting up QIT.

The activities began with six pilot departments but has now expanded to become an effort across the entire hospital, resulting in improving resource management, enabling the reduction of stock, as well as revealing the whereabouts of items that had been stolen and hidden in storage, and the capacity has been created to enable discussions to be held on improving the workplace environment beyond the different occupational roles, with 5S as the common language.

This hospital has already begun making efforts for KAIZEN and is striving to make improvements its work activities by setting themes, such as improving the patient record system, in an attempt to prevent unjust practices in accounting.

### Chapter 3 Verification for the four hypotheses

In this chapter, based on the research which had been conducted both in Japan and locally, and limited to the “5S-KAIZEN-TQM Approach” in our projects, we will state the verification outcomes for the four hypotheses that had been established as the conclusion for this report.

【Hypothesis 1: The main issues in individual hospitals and the process of solution for them may not be clearly reflected in the project design (project purposes, outcomes, and indicators, etc.)..】

In each project which is the subjects of this survey, no problem solving or improved management methods are selected as the project purposes at the level of individual health facilities such as hospitals. Therefore, while there is a limit in verifying the validity of logic by looking at the activities alone which are related to the “5S-KAIZEN-TQM Approach” of each project under such conditions, we dared to conduct the analysis from the viewpoint of whether the central tasks unique to the hospital have been clearly incorporated in the project design. Consequently, the “unique central tasks (problems)” in health facilities such as target hospitals or the process (logic) to solving central tasks by introducing the ‘5S-KAIZEN-TQM Approach’ cannot necessarily be clearly discerned from the project design. Furthermore, because there were some cases where the step of effect generating logic itself contained partial leaps, re-construction of logic of the “5S-KAIZEN-TQM Approach” by the central task (problem type) experienced at the hospital is necessary.

In the manufacturing industry in Japan and in the United States which has the clear organizational goals of pursuit of profit, TQM and KAIZEN activities have been conducted with the purpose of improving their values for business indicators, such as costs and profit, among which 5S has been used as a tool, which has produced results. There seem to be many common basic ideas in private hospitals in both countries which introduced the activities, but it needs to be considered that they are the cases of private hospitals in advanced countries. Furthermore, in both countries where the Approach has been introduced, costs and business perspectives are indispensable no matter that they are public health care institutions<sup>24</sup>, and with the need for cost reduction and improved efficiency as a backdrop in the United States health care sector, improvements were pushed forward in the quality of health care and results had been produced. Also at the four hospitals that had been reviewed in Japan, business improvement had been at the core of 5S-KAIZEN. Activities were underway, based on the logic that solving the “problems” experienced by the hospitals such as improving medical safety and medical services, which had been positioned at levels below that of business improvement, would ultimately be connected to improve business management, and numerous outcomes came to be achieved. Thus, indicators had been established, with improved management at hospitals set as the higher objectives, and logic models have been in practice for implementing the PDCA cycles of the planning of objectives; doing, or taking part in activities; checking outcomes; and acting on new objectives through TQM and KAIZEN activities in a sustainable manner. At Thies Regional Hospital as well, the objectives of the 5S-KAIZEN activity are “the effective utilization of limited resources”, and efforts are being made from the standpoint of business efficiency.

As a result of our verification of the designs for target projects in Africa through our documentation research, we found that the majority of the projects were those that had set as its objectives improving the quality of health care and improving local management capacities in relation to such and only the minority of projects targeted problem solving per hospital. The

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<sup>24</sup> D.M. Berwick “Curing Health Care - A Challenge for New Medical System,” Nakayama Shoten Co., Ltd., 2002

“Program of TQM for Better Hospital Services” was the only program that had included the standpoint of improved management among its objectives. However, no PDM was prepared because it was implemented not as a technical cooperation project but under the scheme of the cooperation preparation survey and regional training and no indicators were established at the beginning. In the instructional visits that are provided once a program has gotten underway, indicators for output and outcome levels are used, such as the various items for 5S and point system evaluations from the checklist for leadership. Furthermore, in cooperation preparation survey, data related to hospital management improvement is proposed in the final report of the survey (document 1.n.) as one of the indicators to measure the outcome for the cooperation preparation survey and while such data is collected as part of the survey, it is not known whether each hospital is making voluntary effort in monitoring.

There were also projects found scattered about where the correlation between project purposes and their activities and indicators were difficult to understand. For example, there are cases in which “the placement of 5S activity teams” are set as indicators to measure “the strengthening of leadership”, which is a project target, and also cases where “the establishment of 5S” is identified as an activity for achieving the “strengthening of maternal and children’s health services”, where there are projects in which operational KAIZEN activities needed for the next steps are not necessarily adequately planned where it was difficult to understand the projects for third parties such as the project activities without the logic which would lead to the goals or without the additional explanation about the establishment of the indicators for measuring achievement.

From local research as mentioned in Section 2, Chapter 2, the lack of resources such as labor, goods, and money, the poor environment found within hospitals, and the poor communication among staff have been identified as the issues that are faced by hospitals, and the fact has been confirmed that 5S has produced significant outcomes in improving the hospital environment and enhancing organizational capacities. However, the steps had not been made clear as to what kind of logic the issues faced by hospitals could be resolved with the implementation of the “5S-KAIZEN-TQM Approach”, and it became evident that issues had also remained concerning the establishment of project purposes and appropriate performance indicators.

For resolving such issues, we present the following proposals in Chapter 4:

- 1) Make clear the core issues for each hospital which are possible to resolve with the “5S-KAIZEN-TQM Approach”.
- 2) Establish a logic model for expressing effect with a clear path for resolving the core issues.
- 3) Make clear the considerations for utilizing a logic model of expressing effect, as well as the limitations of the main approach.
- 4) Organize goals, outcome as well as examples of indicators (qualitative and quantitative) for measuring such effect for each stage of the logic model for expressing the effect of each hospital for the introduction of ‘5S-KAIZEN-TQM Approach.’”

**【Hypothesis 2: There are factors that disturb development from 5S (environmental renovation in hospital) to KAIZEN (renovation in work processes, etc.) .**

The method for introductory training of the Approach as well establishing the attainable indicators, which can establish goals based on logic must be proper because it will otherwise become the factor for inhibiting the 14 developments. In order to promote development from 5S to KAIZEN, KAIZEN must be taught so that it is easily understood at the early stage of introduction of the ‘5S-KAIZEN-TQM Approach’ (“KAIZEN Education for Beginners” is

explained in detail in the logic for improving the “job” quality in Chapter 4.4.5.). Furthermore, in establishing the goals and indicators, establishing the objectives and indicators for each level according to the step level of the logic for expressing effect and it will also be necessary to develop the system for the workplace environment where such indicators can be obtained.

As stated in hypothesis 1, improving business management is the final objective of 5S-KAIZEN-TQM activities that are conducted at companies and hospitals in Japan and the United States. TQM and KAIZEN are activities for individuals to understand the issues that surround them and to initiate the PDCA cycle for resolving those issues in a sustainable manner. These match the participatory types of problem-solving that are stated as definitions for KAIZEN in the “Preparatory survey on the program of quality improvement of health services by 5S-KAIZEN-TQM” (Document 1.o.), which are, in other words, in line with the PDCA cycle. “Program of TQM for Better Hospital Services” and related projects position the 5S as the entry level for KAIZEN, but the difference is that the steps consist of first improving the work environment with 5S and then improving work procedures with KAIZEN. While the Mbeya Consultant Hospital of Tanzania is a successful example of following the clear steps, 5S also includes methods for performing duties, such as, for example, improving work conditions by making rules on where to store items or by establishing the methods and frequencies of cleaning, and is not necessarily limited to improving the environment or for improving specific items. While 5S is considered the entry point, the effort contains KAIZEN components as explained earlier and it was effective in that the foundation was prepared for gradually implementing KAIZEN while working on 5S activities. On the other hand, the tools for KAIZEN not only include 5S alone but also many other methods, such as the “elimination of excess” or “standardization”.

The small scale facility such as the Kotiary Hospital in Senegal, which is the target facility of the “Project for Reinforcement for Maternal and New Born Health Care Phase 2”, implements the 5S and relatively simple KAIZEN simultaneously and it seems important to utilize such good examples while expanding the method according to the target facility.

Furthermore, KAIZEN had been treated separately from 5S so that African medical professionals who are unfamiliar with the concept of operational improvement can acquire without confusion from simple concept to more complicated concept. It also aimed to enable development of phased activities while actually feeling the effect in general African hospitals where the spontaneous efforts towards operational improvement are extremely weak. It seemed that the training conducted with clearly separated steps possible inhibited the seamless development from improvement of goods (5S) to operational improvement (KAIZEN). However, even if the 5S was introduced while clearly positioned as a part of KAIZEN, there is no guarantee that the development from 5S to KAIZEN will be smooth, which is a point that warrants further verification. Furthermore, the 5S Implementation Guideline used in the Senegal Health System Management Enhancement Project, 5S and its effect before and after the introduction is described in an easy-to-understand manner using photographs while the description on KAIZEN is relatively few compared with the volume of writing on 5S and the examples of implementation seemed relatively few as well.

**【Hypothesis 3: Consistent involvement of all who are concerned in hospital from the start of activity is associated with continuation of 5S-KAIZEN-TQM activities (insufficient involvement has an impact on continuation.)**

As there were numerous case studies in which there had been no consistent involvement by all relevant persons within the hospital from the time that activities were commenced, and

regardless of whether commencement had been related to partial department, it had been possible to select pilot departments and develop and continue projects by expanding successful case studies to other departments, so it is possible to say that this hypothesis is not necessarily proper.

For example, as in the case of the Mbeya Consultant Hospital in Tanzania, the success in one department can become a showcase that gives rise to spurring interest among other departments in the organization, and activities can expand as they continue on. In this way, the selection of a pilot department and starting 5S on a small scale has been met with success, so the initial involvement of all relevant persons at a hospital does not necessarily secure the sustainability of such activities. And in reality, it is difficult to involve all persons in fields of specialization such as doctors from the outset, and there is concern that forcing them to be involved may be met with resistance or the lack of cooperation, in which case negative impact could occur on the sustainability of activities.

However, at small-scale facilities such as the health post in Senegal, there are many cases in which the director and all staff, together with local cooperation, take part in 5S-KAIZEN-TQM activities and have achieved success, and it maybe surmised that the elements of the size of these facilities may have a strong relevance.

In survey interviews conducted on experts who had been involved in the implementation of the “5S-KAIZEN-TQM Approach” as mentioned in the African health care sector in Section 1, Chapter 2, the opinion that “it is favorable to start procedures after determining a range that is within the scope that can be observed by the director and QIT” is one way of viewing things that supports the relationship between the breadth of involvement at the start and the size of the hospital.

At large companies or major hospitals in Japan as well, since it is possible to allocate sufficient resources of experts and persons responsible for the activities from the beginning, and plenty of time and budgets can be allocated for advance training, there are cases in which activities are commenced as an initiative spanning across the entire organization. However, as both human resources and budgets are limited at the majority of small and medium-sized companies, the typical methods<sup>25</sup> used are to select a pilot department and to start small, and to eventually develop these on a larger scale. Small enterprises that are run by families, on the other hand, have no need to break down their organizations in the first place, and end up taking part in activities as a whole.

At the same time, it has become clear that top management at hospitals and QIT members play an important role in sustaining activities.

The following activities are some of the points that may be identified as factors that promote sustainability as a part of their roles:

- (1) The strong commitment and examples that are set by top management provide psychological and material support for activities, and create an environment in which activities may be continued with a sense of reassurance.
- (2) QIT members take part in the series of activities regularly, from the planning stage to monitoring, and seek to create a visualization of the outcomes and boost sustainability.
- (3) Top management takes actions to persuade staff who are not motivated in a tenacious manner and prevent activities from becoming stagnant.

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<sup>25</sup> “The KZ Method” Improving Factories”, Japan Management Consultants Association, Yukio Kakiuchi, 2008

- (4) When KAIZEN and TQM activities are being conducted across different departments, top management and QIT members make adjustments to support the continuation of activities.

**【Hypothesis 4: When deploying the scenario, “From establishing 5S pilot hospitals to disseminating all across the country by the Ministry of Health”, the lack of inspection of the results and of input resource for the “5S-KAIZEN-TQM Approach” at pilot hospitals are bottlenecks of the deployment.】**

Generally speaking, verification of result related to the approach in pilot hospital and securing input resource revealed the Approach was a bottleneck in the nation-wide development as conducted by the central government and supervising ministries and agencies such as the Ministry of Health. Furthermore, in Mbeya Consultant Hospital in Tanzania and Kotiary Health Post in Senegal, the efforts were enhanced in their own facilities by securing strong support and assistance from the Ministry of Health and State Medical Agency by taking sufficient time while the Mbeya Consultant Hospital was successful in expanding to external facilities.

For example, while these are minority cases, there are facilities that have started making independent efforts for the “5S-KAIZEN-TQM Approach” after hearing about it, such as the Gaspard Camara Health Center in Senegal and Mbalizi Hospital in Tanzania, and where their efforts have been met with success.

In the case of Japan, while this is an example in private hospitals, Takeda General Hospital and Iwata City Hospital have adapted 5S independently while seeking the guidance of external experts, and the Ministry of Health has not been involved.

The NDP (National Demonstration Project on TQM for health) in the United States is also a volunteer project that involves hospitals and companies, and in the case of Sri Lanka, the activities of one doctor had been the start of such efforts.

One of the reasons why these activities have been made possible is that, as demonstrated by the case studies for such efforts, 5S and KAIZEN are activities which are possible to implement with few inputs, and it is up to the wishes of the health care facilities on whether or not they will engage in these activities.

Meanwhile, the health and health facilities are still a minority which is achieving major outcome based on their effort of introducing the “5S-KAIZEN-TQM Approach” on their own. Also, in Sri Lanka, there is the fact that the measures for a long term national health care plan, implemented between 2002 and 2007 with support from JICA, had accelerated nationwide deployment. This approach had been acknowledged as one of the crucial items for reform in the health care sector, and the Sri Lankan Ministry of Health had decided to implement this approach on a nationwide scale, creating a strategic plan for its dissemination and positioning the Castle Street Hospital for Women as an ideal model for public hospital management in the country. Thus, there are possibilities for enhancing efficiency in such deployments in looking toward dissemination on a national scale by designating a pilot hospital, verifying the activities that are conducted at the facility, and providing support in relation to inputs to enable more efficient deployment. However, the approach is not possible to deploy unless top management at the hospitals where the approach is being implemented has the desire to proceed with the introduction, so thus the most important thing in providing side support to hospitals of the Ministry of Health is to appoint high-ranking personnel such as the head of hospital who have the interest and will to carry through the approach at the respective hospitals. Based on the

above-mentioned the role expected of the Ministry of Health as a policy to promote the nation-wide deployment of the “5S-KAIZEN-TQM Approach” is assumed to be as follows:

- (1) Supporting the dissemination activities at pilot hospitals from the standpoint of resources
- (2) Developing structures, such as creating project teams consisting of persons from the ministry and from the pilot hospital
- (3) Developing the information from each of the hospitals on their successes horizontally on an organizational scale
- (4) Preparing and disseminating unified guidelines, manuals, and text
- (5) Preparing a reward system in which incentives are maintained from both the financial aspect and in terms of outside reputation.

### **Column 3. What is “excess”?**

When we are making improvements in the work around us, we often say to “eliminate excess”. What then is “excess”? Perhaps the answer to that which is often heard might be “work that is not necessary” or “work that is not useful”. Do any of you take part in such “unnecessary work” or “useless work” in your daily routine? The majority of people will probably say, “I do not do that kind of work”. In the work that we do each day, we have spent a lot of time in contriving our own creative methods, so we feel personally that these are the ways that are the most practical and effective. If we were to say to such a person; “Your work is full of waste”, the person would probably raise his or her voice and react to the effect of “You are saying something like that because you have never done my work and are not familiar with what I do”.

But try changing, just a little, your perspective on your work. This time, instead of looking for “excess”, consider which of the tasks (actions) that you do where you might be offering added value to your customers. In other words, which of your actions do your customers pay money for? All the work that you do other than the part that customers (if you were the customer) pay for are “excess” efforts. Think in this way, and try to review your work once again.

A very extreme example might be a nurse who gives injections. For the patient, what is necessary is the task of “injecting his or her arm with the injection needle”, “injecting the fluid”, and “extracting the needle from the arm”, and all other work is in “excess”.

Of course there is also other necessary work, such as sterilizing the arm, but that type of task does not produce the primary value, so the time taken for these actions should be shortened as much as possible so they still produce the same results, and efforts should be made for “KAIZEN”. What do you think about other tasks such as “walking to a faraway shelf to get the hypodermic syringe” or “looking for the injection fluid”? How about the task of “going over to pick up gauze for sterilization”?

In this way, by understanding which of the tasks are the ones where you provide added value to your customers and making a habit of thinking about them, you enable yourself to find “excess” all around you. Voluntarily finding and doing away with “excess” in this way is what KAIZEN activity is all about. At this stage, there is not much need for either mathematics, or even arithmetic.

Don’t you think it makes a big difference whether or not you know even this much before starting your efforts for 5S?



## **Chapter 4 5S-KAIZEN-TQM Logic model and indicators for hospitals**

### **4.1 Observations based on Verification Results**

As stated in Chapter 3, as a result of our research on our subjects, the 15 countries located in Sub-Saharan Africa, it became evident that two major issues exist concerning the implementation of the “5S-KAIZEN-TQM Approach” at health facilities in these subject countries.

The issue which became evident in our verification of the first hypothesis:

Task 1: No model has been presented which clearly establishes the path (logic) for the outcome generating which will lead to the solution of central issue by introducing a “unique central task (problem)” or the “5S-KAIZEN-TQM Approach” in such facility which treats single units of health facilities such as hospitals as subjects.

The issue which became evident in our verification of the second hypothesis:

Task 2: From the two-step manner of thinking for implementing 5S and then introducing KAIZEN, KAIZEN may not have been accurately understood at the implementation stage of the Approach. (On the other hand, this survey does not reveal the effect of the phased introduction in African public hospitals.)

Task 3: Most of the indicators for the activities are at the 5S level, and there is no established indicator for the effect at the KAIZEN level. (In establishing the objectives and indicators, it is important to establish the objectives and indicators depending on the step level of the logic of the effect generating.)

As a way to resolve and improve these issues, we have formulated and proposed the utilization of the “Proposed logic model adopting the “5S-KAIZEN-TQM Approach” in hospitals” which focused on the single unit of hospitals and classified the models, indicators, and considerations of the outcome generating by problem types experienced by the hospitals. Specific flow and structure are as follows. In this chapter, we discuss the solutions for the above-mentioned two tasks:

- 1) Clarify the central issues which exist at hospitals in the subject country and are possible to solve in the “5S-KAIZEN-TQM Approach”
- 2) Formulate and utilize the proposed logic model for expressing effect of the central task (per problem) clarifying the path to resolve the central issues using the “5S-KAIZEN-TQM Approach” in order to establish the proper logic which will lead to the problem solution in individual hospitals
- 3) Clarify considerations for utilizing logic model for effect generating
- 4) Organize examples of indicators (qualitative and quantitative) for measuring the objectives, outcome, and its effect per stage of logic model for effect generating.

### **4.2 Development of the logic model**

In developing a proposed logic model for 5S-KAIZEN for hospital facility as main unit, a logic model for the manufacturing industry, which first implemented and developed this method, has been introduced as the basis. In creating this draft model, consideration had been made for the differences between the work at hospitals and that in manufacturing, and also the conditions in which hospitals are positioned in their countries.

#### 4.2.1 The logic model in Japan's Manufacturing Industry

A logic tree for 5S-KAIZEN-TQM within Japan's manufacturing industry has been presented in Figure 3, with "sustainable development of a company"<sup>26</sup>, which is generic in the manufacturing sector, as an overall goal. 5S-KAIZEN is a method for improving business management that has developed in the manufacturing sector in Japan, and while TQM has its origins in the manufacturing industry in the United States, it is a method for improving management<sup>27</sup> that has been developed in a unique manner in Japan. For both parties, its final objective is the sustainable growth of companies, based on steady improvements in business management. In manufacturing, the elements for achieving improved business management are PQCDs, i.e. Productivity, Quality, Cost, Delivery, and Safety<sup>28</sup>. And what becomes necessary as a prerequisite for outcomes to emerge is the organizational capacity of management and employees, or their teamwork skills; their skills to improve business management; and the high moral standards that are produced by the realization of employee satisfaction. The essence of KAIZEN that realizes such improvements is the comprehensive elimination of "excess", or "waste". 5S is positioned as a tool for eliminating "excess", as well as being used as a tool for enhancing organizational capacity.

Thus, the reduction of "excess" and "cleanliness", which guarantees the maintenance and continuation of 5S, and "enhanced awareness" may be sited as the direct outcomes of 5S activities. While "excess" generally refers to the resources that are wasted of people, objects, money, space, time, information, or the disuse of time or effort, we have chosen to discuss here the representative "excess of objects", "excess (time) wasted in searching", and "excess facilities".

The relationship between direct outcomes and intermediate outcomes does not correspond one on one and is instead a compounded connection, so the respective relationships have been presented with the use of arrows. PQCDs, which has indirect effects, means continuous improvement and progress, rather than individual improvement that each happens only once, so thus "improving organizational capacity" has been included in a horizontal manner. This type of "continuous" improvement is the essence of KAIZEN, which aims to thoroughly eliminate "excess" and thus becomes the most important characteristic in this chapter as a future point at issue.

In the case that project purposes have been aligned at the direct outcome level, a sense of achievement will be obtained once that objective has been achieved, and activities will thereafter become stagnant. For example, in a case in which the direct outcomes of "tidying up and putting tools in order" were to be established as a project purpose, once the "tidying up and putting tools in order" has been completed, the purpose of the activities will seem to have been achieved, and it would mean that the activities would become stereotypical and monotonous. On the other hand, if the project purpose had been set at a higher level for "sustainability" and "improved productivity", then even after the completion of the "tidying up and putting tools in order", there are still endless possibilities remaining for improvements such as "improved rates of operation" or "improving operational procedures", making the activities voluntary and continuous. This is the state at which KAIZEN activities are undertaken.

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<sup>26</sup> "How to Advance KAIZEN Activity", Osamu Shinoda, 2007; Japan Management Association Management Center (JMAM)

<sup>27</sup> "TQC kara TQM e (from TQC to TQM)", Teisuke Kitahara, 1991; Yuhikaku sensho

<sup>28</sup> "Toyota Production System", Yasuhiro Monden, 1991; Kodansha

However, even at this level, unless there is an understanding of why “improved productivity” is necessary, there is concern that these activities could become stagnated due to the sense of burden that would arise. For example, if one were to assume that “improved productivity” would create reductions in the necessary manpower and that he or she might lose his or her job, the energy directed toward these activities would decrease and the person could in fact become a resisting force. Therefore, there is a need to conduct daily activities while sharing the information that “improved productivity” would tie into the “sustainable development of the company”, the super goal for management, through “increased sales” and “increases in profit”, and understand property that one’s job would be secured into the future and that remuneration could also increase. Understanding the super goal will also mean understanding that the extent of activities will not only stop at “improved productivity” (P) but also expand for actions to be taken toward making “improving product quality” (Q), “cost reductions” (C), “improved delivery” (D), and “enhanced safety” (S). These are the steps that are being taken in TQM (Total Quality Management).

In these ways, with the “5S-KAIZEN-TQM Approach” used in the manufacturing industry, all employees have an understanding of the super goals of their companies, based on which they voluntarily continue KAIZEN activities and use 5S as one of its tools. Their activities are conducted in small groups, such as QC circles, in a bottom-up manner, but for their activities to continue, there is a need for management to indicate, top-down, the super goals and the higher objectives in a thorough way for all employees. Based on the super goals, middle management will include the higher objectives in the goals that are set for his or her department and establish and indicate target figures and indicators, but the ways in which these objectives are realized will be left to the small groups and the middle manager will engage in following up and supporting their activities.

Thus, the above is the logic model for 5S-KAIZEN-TQM in manufacturing and its method of operation.

#### **4.2.2 5S-KAIZEN-TQM Logic model at hospitals in Africa**

The greatest difference between the manufacturing industry and health care is the point that whereas the items that are handled in manufacturing are objects, in health care this is people. In other words, there is a need to continue to produce the same objects with the same quality in manufacturing, but in health care, the conditions of patients will vary completely, so it becomes necessary to handle cases individually, in accordance with patient conditions. However, while the other party may vary, there is a universal aspect to the act of taking blood samples, and the quality of drawing blood may use these methods for improvement and for reducing the numbers of medical accidents that occur when blood samples are being collected. In other words, while it is difficult to apply these methods to the medical practices for curing ailments, significant results may be expected in the same way as in manufacturing for improving tasks that accompany acts of medical intervention, the management of objects, and the management of people.

Based on the above ideas, a 5S-KAIZEN-TQM logic tree for hospitals, which has been created using cases in manufacturing as earlier mentioned as references, is presented in Figure 7. As stated in Chapter 2, this method is already often used as a method for improving management at health facilities in Japan and the United States. At private hospitals in Japan and the U.S., there are many cases where “improving business management at hospitals” are, in a similar fashion as in manufacturing, identified as the overall goal. For example, at Japan’s Nerima Hospital, the implementation of TQM in March 1991 is said to have been triggered by a long ongoing chronic

deficit that had caused financial difficulties<sup>29</sup> for the institution. In his greetings published on his hospital website, the hospital director says that in addition to sustaining the operation of “Nerima Hospital”, he will set up a “research facility for the enhancement of health care” and “engage in research and development for achieving corporate objectives and deploy projects associated with such”, showing that “sustained operations” is positioned as a business objective. Also in the case of Takeda General Hospital, there is a declaration that with the purpose of deploying 5S activities, the institute will aim to become “an organization with high standards of product quality, safety, and productivity”, having confirmed at the outset of implementation awareness<sup>30</sup> that “continuance will be at risk unless change is voluntarily sustained”<sup>31</sup>. As to the NDP (National Demonstration Project on TQM for health) that had been introduced at 21 hospitals in the United States, there is also awareness<sup>32</sup> as a backdrop that “due to the commercialization of health care, specialized management has become necessary not only for commercial institutions but also for the survival of nonprofit organizations”.

Therefore, as far as private hospitals in Japan and the United States are concerned, it may be said that as in the manufacturing industry, the sustained development of the organization can be considered to be the super goals in the 5S-KAIZEN-TQM logic tree, and that the higher objectives become indicators which tie in to improving management. This is saying that the super goals are the “sustainable development of hospitals”, and the “higher objectives” may be identified as the positioning of “increases in profit”, “increases in sales”, and “increases in patient satisfaction”. However, almost all the hospitals in the subject countries in Africa are national and public facilities, and a situation exists in which most of them are supported by national budgets or funds that are received from donors. In other words, when considering that the positioning of hospital management is the provision of public health care services for the people of a country, it is difficult to simply apply the model in Japan and the United States. Taking these conditions under consideration, the super goal within a limited budget has been established as the “continuous provision of public health care services”. “Increase in profit” had been replaced with a higher objective of “cost cutting” per patient, and a goal had been established to offer services to as many patients as possible. In this way, “increases in sales” had also been replaced with “increases in numbers of patients”. As for the “increased sales,” we have decided to exclude because when we take into account the present conditions of Africa, the increased number of patients does not lead directly to the increased sales. In Africa, too, provision of medical service to as many patients as possible within the predetermined budget by adding the “increased number of patients” once the external conditions improve.

As project purposes in African hospitals are compared with the project purposes in the manufacturing industry, the “prevention of medical accidents” corresponds to the “improved safety” in the manufacturing sector and “improved “job efficiency” corresponds to the “improved productivity” and “cost reduction” and “improving job quality” corresponds to “quality improvement”<sup>33</sup>. When these are applied to the “5S-KAIZEN-TQM Approach” logic based on local research which had been presented in Section 3, Chapter 2, the “prevention of medical accidents” can be divided into the “elimination of medical accidents” and the “prevention of hospital infections”, and “improving “job” efficiency” can be broken down into “improved management of pharmaceutical products and equipment” and “improving job efficiency”. The “improvement of organizational capacity” was assumed to be the same, which

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<sup>29</sup> “A study on the introduction of TQM in hospital management”, 49<sup>th</sup> edition/no. 5; Seiichi Iesato, 2006

<sup>30</sup> <http://www.nerima-hosp.or.jp/foundation/index.html>; May 2013

<sup>31</sup> “5S for eliminating errors and accidents at the medical scene”, 2011; Akio Takahara, JIPM Solutions

<sup>32</sup> Donald M. Berwick, “CURING HEALTH CARE”, 1990

<sup>33</sup> “5S for eliminating errors and accidents at the medical scene”, 2011; Akio Takahara, JIPM Solutions

is a prerequisite for project purposes to emerge, are the same as in the case of the manufacturing industry.

Based on the ways of thinking as mentioned above, we have developed the “5S-KAIZEN-TQM Logic Tree for Hospitals in Africa” (Figure 7). We have targeted on and formed the areas where the “5S-KAIZEN-TQM Approach” can be adopted in this model which utilizes the way of thinking of the “5S-KAIZEN-TQM Approach” as much as possible and form a project with the aim to enhance the management of public hospitals in developing nations such as Africa. In forming actual project, we assume to establish more diverse objectives and because there are tasks (especially those which cannot be expected to be improved by the “5S-KAIZEN-TQM Approach”) which are not necessarily considered in this model, adequate consideration is needed in actual adoption. The logic for expressing from direct effect to effect that exceed the project purposes will be explained later in detail in Chapter 4.4. per each project purpose.

Furthermore, we initially aimed to organize and develop the project design idea adopting 5S (project purposes, outcome, activities and indicators) in “Target 3” per health subtask in health and health facilities, but we realized the limitation as a result of analysis that the “5S-KAIZEN-TQM Approach” cannot handle the improvement of medical act and medical technology themselves and we substituted this by organizing the logic model and relevant indicators by type per each major task as experienced by the hospitals. When examining the introduction per hospital unit specifically with the support from JICA, the concerned parties will pay attention to the relevant parts of the logic model as needed in order to utilize in planning and proposing.

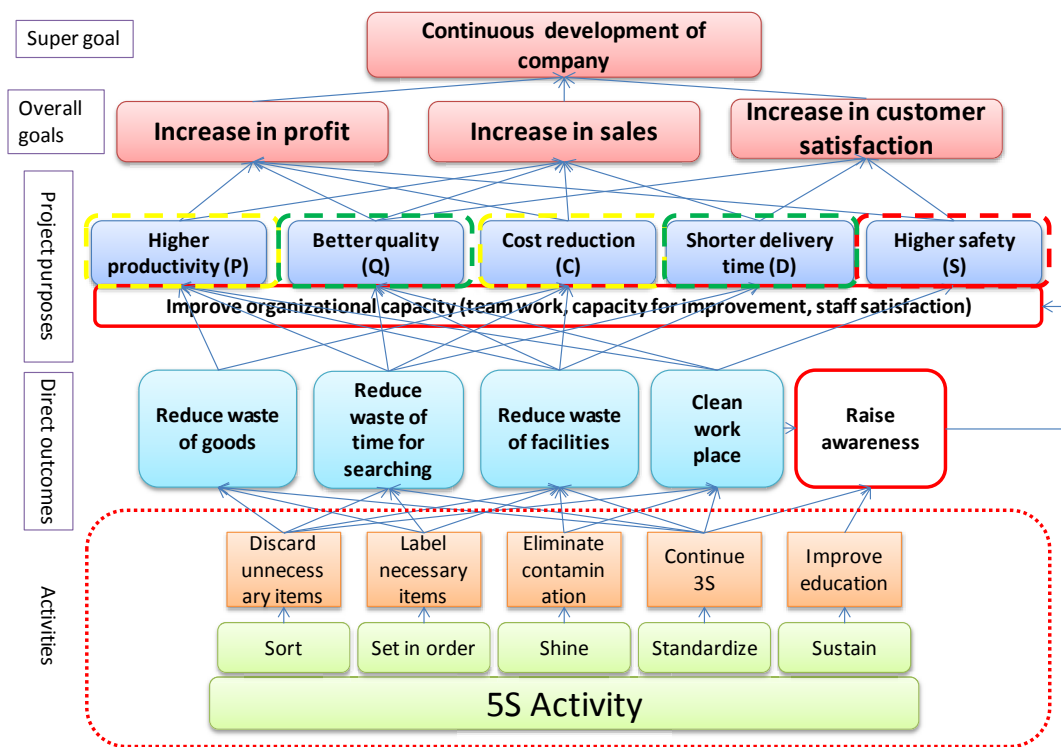


Figure 6 Logic tree for 5S-KAIZEN-TQM in the manufacturing industry in Japan

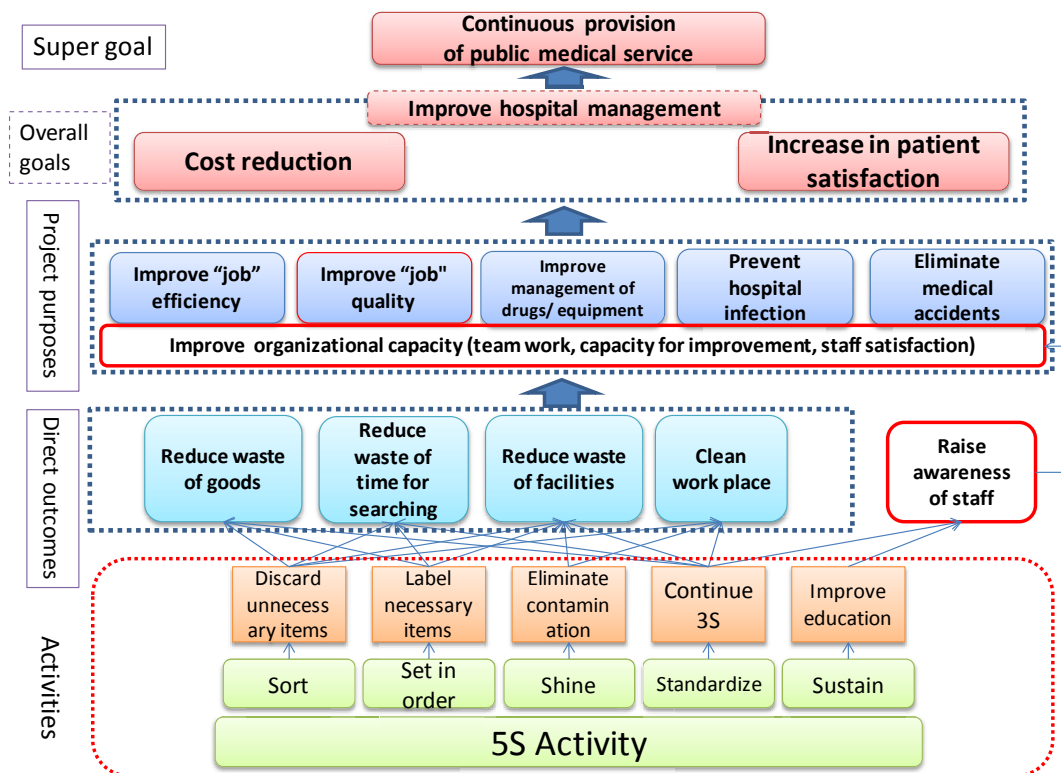


Figure 7 Proposed 5S-KAIZEN-TQM logic tree for hospitals in Africa

### 4.3 Logic and indicators

The “5S-KAIZEN-TQM Logic Tree for Hospitals in Africa”, as mentioned in Section 2, Chapter 4, will be explained in detail as a logic model for the production of impact in the following chapter, and in this chapter we will first go over the structure of the logic model and the way of thinking for its indicators.

The issues for each of the logic models have been categorized with the understanding that the issues are the project purposes in the earlier mentioned logic tree. The project purposes have been extracted in an analogy with the project purposes for the manufacturing industry, using as a reference the Project Logic at Hospitals in Senegal and Tanzania” (Figure 5) which are presented in Chapter 2, based on local research.

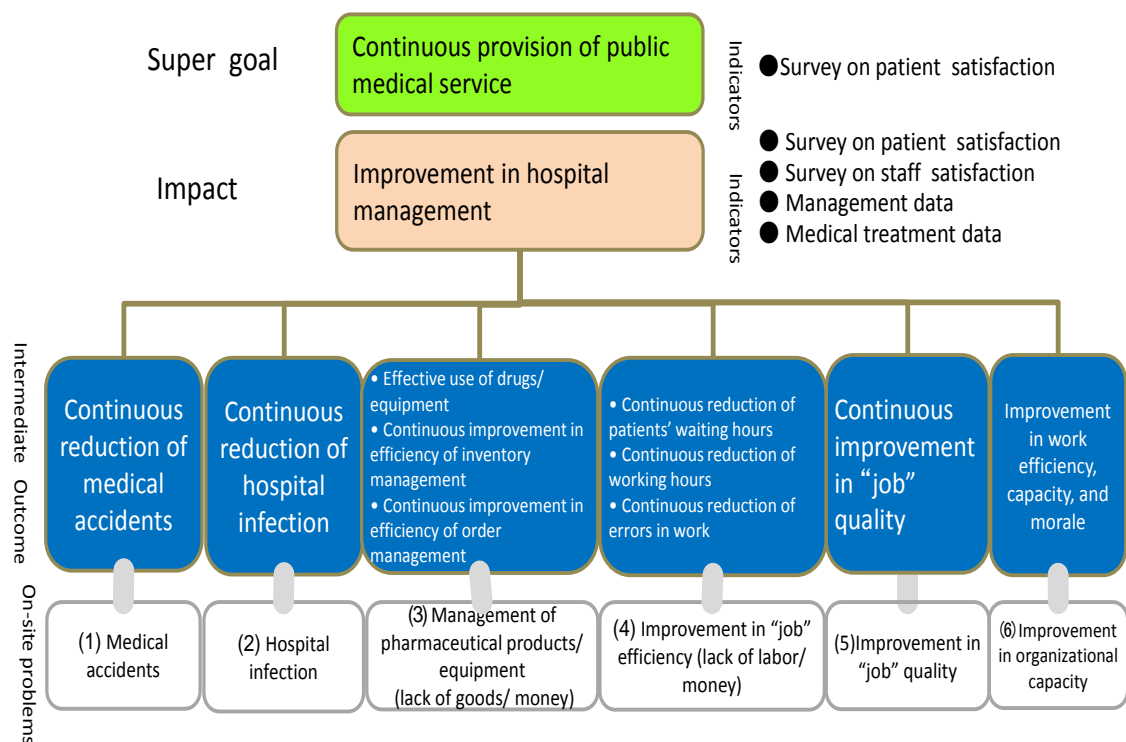
The relationship between project purposes in manufacturing and the issues in the logic model (project purposes) created on this occasion will be combined and presented as below.

**Table 17 Comparison of the project purposes between a hospital and manufacturer**

No	Issues at hospital (project purposes)	Project purposes in manufacturing
1)	Eliminating medical accidents	Improving safety standards
2)	Preventing hospital infection	Improving safety standards
3)	Improving management of pharmaceuticals/ equipment	reductions in cost (Improving productivity)
4)	Improving efficiency	Improving productivity ( reductions in cost)
5)	Improving “job” quality	Improving product quality (improved delivery)
6)	Improving organizational capacity	Improving organizational capacity

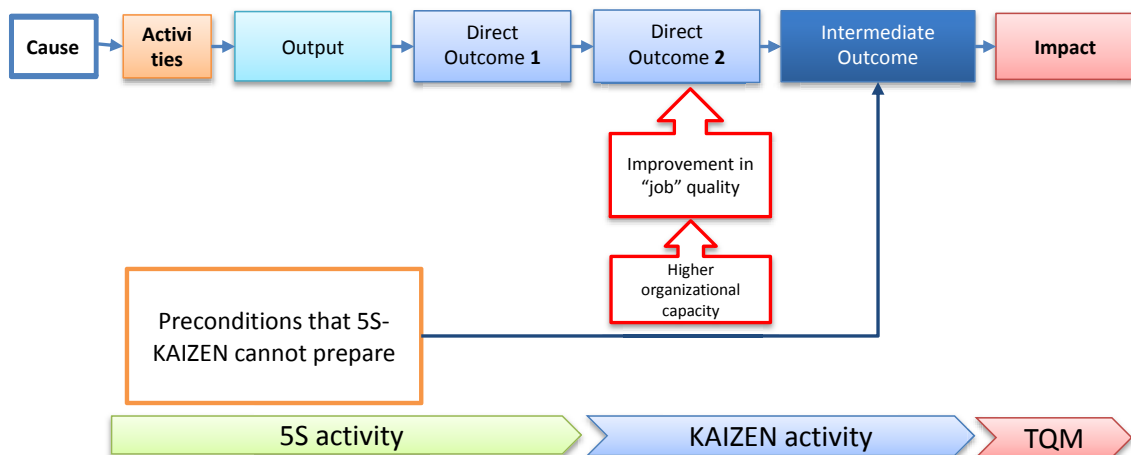
Furthermore, the logic in the manufacturing sector does not necessarily apply to the extraction of problems in hospitals in certain cases, we have limited it to the reference within the applicable scope.

Figure 8 shows what kind of impact will be achieved through the use of the “5 S-KAIZEN-TQM Approach” and by following what kind of logic in terms of the improved hospital management. By drawing out the issues and logic applicable for each of the individual hospitals and establishing their objectives, it is possible to use this approach and achieve more concrete effect.



**Figure 8 Proposed the “5S-KAIZEN-TQM Approach” logic model according to issue**

Figure 9 shows the basic structure of a logic model that we will now look at. The production of the effects created from the engagement of activities, from the causes to impact, is shown horizontally in the logic model. The resolving of issues at hospitals will emerge here as intermediate outcomes. As to the hospital issues (1) through (4), outputs and direct outcome 1 are at the level of 5S activities, and direct outcome 2 and its intermediate outcome are results at the KAIZEN level. It may be said that a state in which TQM is realized through the emergence of impacts.



**Figure 9 Basic structure of the logic model**



As a prerequisite for producing results at the KAIZEN level, there is a need for the issues at hospitals, that is (5) improving the “job” quality and (6) organizational capacity, to be realized. The prerequisites that may not be dealt with by 5S-KAIZEN have been indicated in the box outlined in a yellow border at the bottom left of the logic diagram. At the same time, an arrow is used to show for which level it is a prerequisite.

Symbols have been added following the itemized activities for indicating the activity level, such as in (S1). The notations from (S1) to (S5) are for the 5S: sort (seiri), (S2): straighten or set in order (seiton), (S3): systematic cleaning or shine (seiso), (S4): standardize (seiketsu), and (S5): service (sustain) (shitsuke). (K) was added for activities at the KAIZEN level.

An overall picture to show the indicators for measuring outputs, outcomes, and impact in the logic model has been compiled and proposed in the document Attachment 6. Indicators at each level of the logic model have also been attached in our explanation of the logic model for hospitals in accordance with each issue.

The following have been used as references in our selection of indicators:

- 1) Check-list items and indicators used in “Program of TQM for Better Hospital Services” that has been implemented in 15 countries in Sub-Saharan Africa
- 2) Indicators that have been established by other donors for measuring outcomes
- 3) Indicators provided by Japan’s Welfare and Medical Service Agency which are used by Japanese hospitals in business diagnoses
- 4) Indicators that had been used in 5S projects which had been implemented at Japanese hospitals (Nerima Hospital, Takeda General Hospital, Iwata City Hospital, and Japanese Red Cross Musashino Hospital)
- 5) Indicators used by the NDP (National Demonstration Project on TQM for health) in the United States.
- 6) Indicators used in KAIZEN activities at the Virginia Mason Medical Institute in the United States.

Because it is difficult to adopt the standard used in private hospitals in the developed nations where the policy environment and operational environment have been developed compared to public hospitals in developing nations where the lack of resource is the problem, the following points were selected from the above as our standards:

- 1) Standards for which the collection of data is believed to be possible in African countries where they have the problem of lack of resources (includes the data for which infrastructure improvement is necessary for the acquisition of data)
- 2) Data that is thought to be possible to be collected in a sustainable manner
- 3) Data for which the costs and level of effort for collection are relatively low

However, currently there are many indicators which have not been acquired as yet, and we expect we will need to sufficiently confirm regarding the onsite verification exam and the environment of each hospital whether the indicators can be collected. Therefore, in indicators which have been acquired or which have already been established in the 15 target countries so that it will help form the project have been marked with a star (☆) (Tables, 18,19, 20, 21, 22, 23, and Attachment 6).

#### **4.4 Logic model proposal**

In this section, we will explain the proposed logic models that show impact from the “5S-KAIZEN-TQM Approach” for the six key issues at hospitals: “medical accidents”,

“hospital infection”, “improving management of pharmaceutical products and equipment”, “improving job efficiency”, “improving job quality”, and “improving organizational capacity”, in accordance with their causes.

(1) Proposed Logic Model for Eliminating Medical Accidents (Refer to Figure 10 and Table 18)

**【Definition of a medical accident】**

“A medical accident includes all accidents that occur in all procedures at all venues related to health care which result in injury or death, and also includes cases in which medical practitioners are the parties affected, or when falls occur in hallways.” (Medical safety measures meeting, 2002, Ministry of Health, Labor and Welfare)

**【Basic way of thinking】**

The main causes of medical accidents have been broken down into six categories: “errors in patient information”, “errors in drugs or medical equipment handling”, “deficiencies in work environment”, “deficiencies in equipment maintenance”, “deficiencies in drugs or equipment”, and “deficiencies in medical skills or knowledge”. Among these, the categories that may be dealt with by using the “5S-KAIZEN style approach for deficiencies” are the following four: “errors in patient information”, “errors in drugs and medical equipment handling”, “deficiencies in work environment”, and “deficiencies in equipment maintenance”. While the remaining two categories, “deficiencies in drugs or equipment”, and “deficiencies in medical technology or knowledge” are not covered, these are the necessary conditions for the end outcome (intermediate outcome), which is the “sustainable reduction of medical accidents”.

“Deficiencies in medical skills or knowledge” becomes an inhibiting factor for the emergence of direct outcome 2. “Improving job quality and “improving organizational capacity”, which will be mentioned later, are conditions that are necessary for the emergence of direct outcome 2.

Furthermore, the process from activities to output and direct outcome 1 is in correspondence relation of 1:1 between specific activity and specific output or specific output and specific direct outcome 1. However, in achieving the direct outcome 2 and intermediate outcome, the continuity of activities such as continuous operational improvement and continuous elimination of errors are called for, and this corresponds to the outcome at the KAIZEN level. Therefore, we need to continue improving further after one improvement has been completed by finding new problems to be solved after that. Furthermore, in such a process, when a new drug, equipment, technology and knowledge are not continuously injected which is not covered by 5S and KAIZEN, improvement and favorable reductions will come to a halt at some level and consequently the achievement at KAIZEN level outcome will be difficult.

We will continue this explanation using the “errors in patient information” which occurs due to the “errors in patient information” as an example case. Three levels of 5S activity have been presented as activities for eliminating “errors in patient information”. The first is “sorting and straightening patient records”, and the output will be to make the “correct records available for immediate access”. The second is activity to sort by “putting up information such as the names of patients on beds”, and the output is the “accurate distinction of patients”. The third is “creating rules for passing on information on patients and putting these to use”, which is an activity at the standardization level, with an outcome of “reducing errors in passing on patient information” when there are changes in shifts for the nurses who are in charge. As direct outcomes of these three 5S activities, it will become possible to “reduce errors in patient information” and “reduce the time required in searching for patient information”.

**【Point to note】**

If those who are engaged in hospitals have only established the 5S-level objectives, once their 5S activities have been completed and outputs have been achieved in a visible manner, the activities related to the particular case will end at that point. On the other hand, if the concerned parties have established the intermediate outcome-level objectives and implement KAIZEN related training from the (“improving organizational capacity”), once methods for reviewing tasks (“improving job quality”) have been mastered, then they will review the tasks voluntarily in preparation for the next improvement for further improving “patient information confirmation method”, find new issues, and proceed to resolve that issue with other 5S activities. Furthermore, if any of those who are engaged in hospitals have the strong awareness that “sustainable improvements to patient information confirmation methods” are being conducted for the purpose of the “sustainable reductions of medical accidents”, which is at one step higher level than the operations being conducted at present, he or she will become aware that there are also other issues that may help reduce “medical accidents”, such as “methods for storing drugs and equipment”, “methods for handling drugs and equipment”, “methods for moving about the hospital”, the “layout” of the hospital, and “equipment maintenance methods”, and then it will be easier to become aware of other problems which will likely become the cause of accidents and use 5S to continue KAIZEN in his own surroundings.

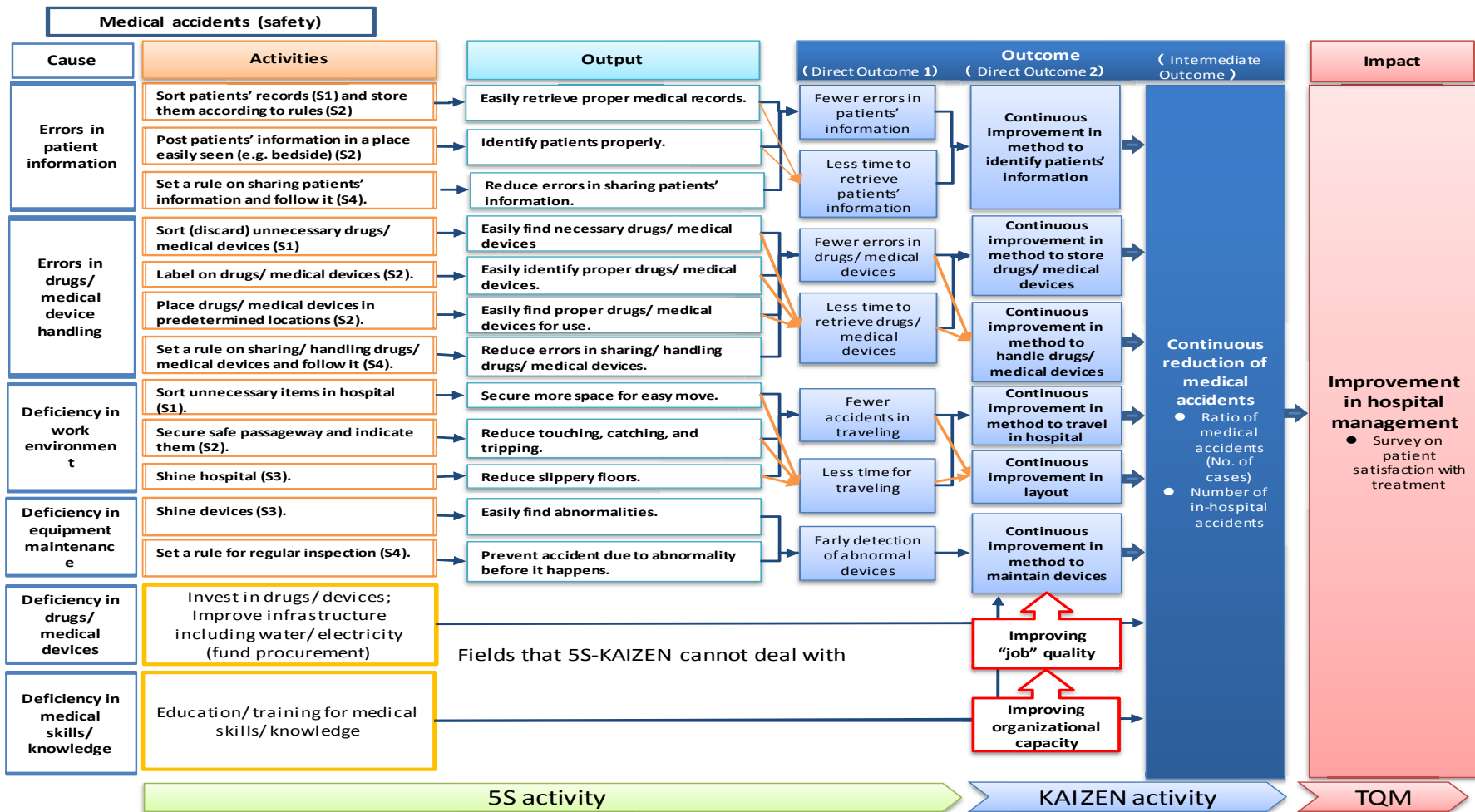


Figure 10 Proposed logic model for eliminating medical accidents

**Table 18 Proposed indicators for logic model for eliminating medical accidents**

Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact
Errors in patient information	<ul style="list-style-type: none"> <li>● Sorted files and medical records (S1)</li> <li>● Medical records stored according to rule (S2)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of mistaken retrievals of patient information</li> <li>● Number of lost information on patients</li> <li>● Average time required to confirm patient information</li> <li>☆ Number of claims from patients</li> <li>● Degree of understanding of staff on handling rules</li> </ul>	<p>Project purpose "Continuous reduction of medical accidents"</p> <ul style="list-style-type: none"> <li>● Number of medical accidents (per year)</li> <li>● Number of deaths due to medical accidents(per year)</li> <li>● Number of malpractices/ medical negligences (per year)</li> <li>● Number of implementations of safety measures (per year)</li> </ul>	<p><b>Impact</b> "Improvement of hospital management"</p> <ul style="list-style-type: none"> <li>☆ Degree of improvement in survey on patient satisfaction (hospital facilities/ medical treatment)</li> <li>☆ Occupancy rate of hospital beds (per year) (Number of inpatients/ total number of beds)</li> <li>● Number of patients referred from other hospitals (per year)</li> <li>● Number of medical treatments (per year) (operations, checkups, deliveries)</li> </ul>
	<ul style="list-style-type: none"> <li>● Patient information posted near the patient(S2)</li> </ul>			
	<ul style="list-style-type: none"> <li>● Established rules on sharing patient information (S4)</li> <li>● Work performed according to rule (S5)</li> </ul>			
Errors in drugs/ medical device handling	<ul style="list-style-type: none"> <li>● Discard of unnecessary drugs/ medical equipment (S1)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of disposal of unnecessary drugs/ equipment</li> <li>● Number of mistaken retrievals of drugs/ medical equipment</li> <li>☆ Average time required to retrieve drugs/ medical equipment</li> <li>● Degree of understanding of staff on handling rules</li> </ul>		
	<ul style="list-style-type: none"> <li>● Labeled drugs/ medical equipment (S2)</li> </ul>			
	<ul style="list-style-type: none"> <li>● Drugs/ medical equipment stored at designated places (S2)</li> </ul>			
	<ul style="list-style-type: none"> <li>● Established rules to discard/ store/ handle drugs/ medical equipment (S4)</li> </ul>			
Deficiency in work environment	<ul style="list-style-type: none"> <li>● Discard of unnecessary items in hospital (S1)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of close calls</li> <li>● Number of patients falling/ hurting</li> <li>● Number of claims from patients</li> <li>● Frequency of cleaning hospital</li> </ul>		
	<ul style="list-style-type: none"> <li>● Safety pathways ensured and directions posted (S2)</li> </ul>			
	<ul style="list-style-type: none"> <li>● Regular cleaning in hospital (S3)</li> <li>● Predetermined frequency, content, and assignment of hospital cleaning (S4)</li> </ul>			
	Deficiency in equipment maintenance		<ul style="list-style-type: none"> <li>● Regular cleaning/ maintenance of equipment(S3)</li> </ul>	<ul style="list-style-type: none"> <li>● Frequency of cleaning/ inspection of devices</li> <li>● Number of detected defects in equipment</li> </ul>
<ul style="list-style-type: none"> <li>● Established rules to inspect equipment(S4)</li> </ul>				

☆:Indicators that are already utilized in the existing JICA projects

Remarks : 4 indicators listed at the project purpose such as the number of medical accidents are hard to measure even in Japan. In addition, these indicators are related to pure medical techniques. Therefore, it is considerable to set indicators which clearly reflect the direct outcomes at the initial stage.

## (2) Proposed logic for Preventing Hospital Infection (Refer to Figure 11 and Table 19)

### 【Definition of hospital infection】

We have adopted the following definition: “All infections that occur within the hospital environment are called hospital infection, and infections that originate in the hospital, regardless of whether the onset of their symptoms may occur outside the hospital, are called hospital infection. Conversely, the onset within the hospital of infections acquired outside the hospital (the community) are not hospital infection but are called community-acquired infection” (“manual on medical safety measures for medical practitioners”, 2007, Japan Medical Association)

### 【Definition of waste materials】

The “waste materials” discussed here is preconditioned upon the hospital infection and therefore treated as the synonym as the “infectious waste.” The definition for “infectious waste” include pathogens which humans are infected to or has the potential for infection out of which become wastes due to medical actions, etc. out of cotton, gauge, medical dressing, plaster jacket, paper diaper, needle of the syringe, syringe tube, drip infusion equipment, thermometer, testing equipment such as test tube, organic solvent, blood, organs and tissue, etc.

### 【Basic way of thinking】

The main causes of hospital infection have been broken down into six categories: “lack of enlightenment for patients and staff”, “deficiency in measures against infection”, “deficiency in work environment”, “deficiency in waste disposal”, “deficiency in drugs and equipment”, and “deficiency in medical skills or knowledge”. Among these, the categories that may be dealt with by using the “5S-KAIZEN style approach” are the following four: “lack of enlightenment for patients and staff”, “deficiency in measures against infection”, “deficiency in work environment”, and “deficiency in waste disposal”. While the remaining two categories, “deficiency in drugs and equipment” and “deficiency in medical skills or knowledge” are not included, “deficiency in drugs and equipment”, particularly a lack in antiseptic agents or vaccination drugs, can become a cause that inhibits numerous output results for the activities which are undertaken. For example, in order to “reduce infections acquired from the fingertips”, simply washing the hands with soap and clean water will produce a certain level of results, but in order to “disinfect the hospital regularly”, it will become a prerequisite to secure the necessary amounts of antiseptic agents as may be needed. Also, when infection from vaccinations is prevented, significant results can be expected from preventative measures that are taken by all employees. Thus, this becomes one of the prerequisite conditions for the end outcome (intermediate outcome 2), the “sustainable reduction of hospital infection”.

In the same manner as with medical accidents, a “deficiency in medical skills or knowledge” becomes an inhibiting factor for intermediate outcomes (intermediate outcome 1) from being produced. “Improving job quality” and “improving organizational capacity”, which will be mentioned later, are also prerequisite conditions for intermediate outcomes.

The “5S-KAIZEN-TQM Approach” has been cited here as an effective issue for the following examples: “methods of enlightenment for patients and staff”, “methods for reducing sources of infection”, “improving the hospital environment”, and “methods for processing waste”.

### 【Point to note】

In the same way as with medical accidents, as long as employees are clearly aware from the outset “continuous decrease of hospital infection” as the intermediate outcome as common objective, and develop the environment where specific image and means of achievement for

KAIZEN is assured (“improving organizational capacity”), and acquire the method for reviewing work (improving “job” quality), it will be easier to review work spontaneously and solve the issue to further continuous improvement.

As a point to note which is characteristic of Africa where they particularly experience lack of resources, “undeveloped drugs and equipment” will be a major obstacle in carrying out the “5S-KAIZEN-TQM Approach”. For instance, “infrastructure improvement for clean water is a prerequisite for the prevention of hospital infection, and attention will also become necessary for the equipment for disinfecting tools, as well as the supply of power for their operation.

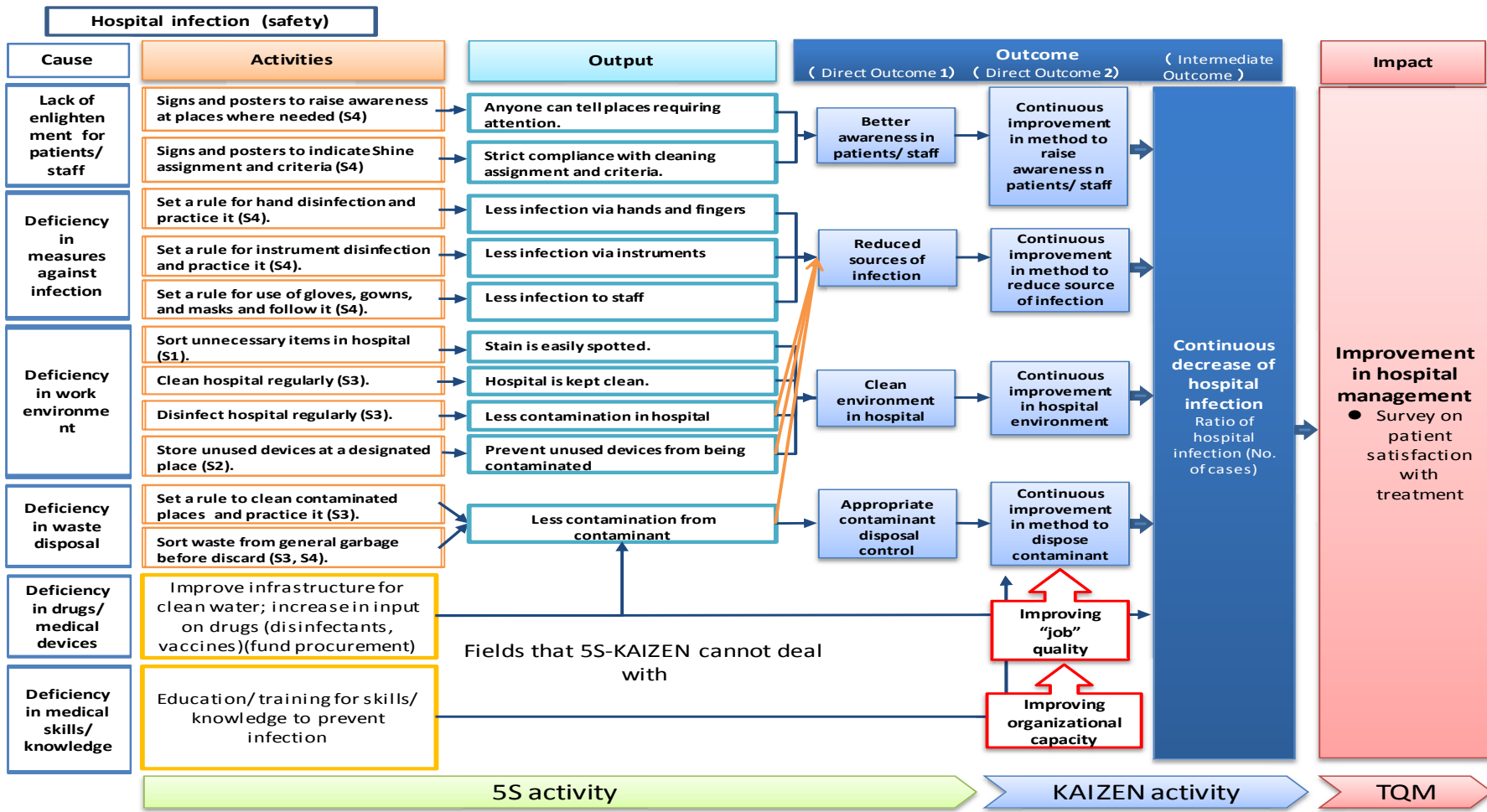


Figure 11 Proposed logic model for preventing hospital infection



**Table 19 Proposed indicators for logic model for preventing hospital infection**

Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact
<b>Lack of enlightenment for patients/ staff</b>	<ul style="list-style-type: none"> <li>● Signs and posters to raise awareness posted at places where needed (S4)</li> </ul>	<ul style="list-style-type: none"> <li>☆ Degree of recognition of rules among patients/ staff</li> <li>☆ Degree of understanding of hospital infection among staff</li> </ul>	<p>Project purpose "Continuous reduction of hospital infection "</p> <ul style="list-style-type: none"> <li>● Number of hospital infection cases (per year)</li> <li>● Number of deaths due to hospital infection (per year)</li> <li>● Number of implementations of measures against infection (per year)</li> </ul>	<p><b>Impact</b> <b>"Improvement of hospital management"</b></p> <ul style="list-style-type: none"> <li>☆ Survey on patient satisfaction (hospital facilities/ medical treatment/ cleanliness)</li> <li>☆ Occupancy rate of hospital beds (%) (Number of inpatients/ total number of beds*100)</li> <li>● Number of medical treatments (per year) (operations, checkups, deliveries)</li> <li>● Number of patients referred from other hospitals (per year)</li> </ul>
	<ul style="list-style-type: none"> <li>● Established criteria for cleaning assignment (S4)</li> <li>● Shine assignment and criteria posted (S4)</li> </ul>			
<b>Deficiency in measures against infection</b>	<ul style="list-style-type: none"> <li>● Established rule for hand disinfection (S4)</li> <li>● Work according to disinfection rules (S4)</li> </ul>	<ul style="list-style-type: none"> <li>● Degree of recognition of rules among patients/ staff</li> </ul>		
	<ul style="list-style-type: none"> <li>● Established rule for equipment disinfection (S4)</li> <li>● Work according to disinfection rules (S4)</li> <li>● Established rule for using gloves/ masks (S4)</li> <li>● Work according to rule for usage (S4)</li> </ul>			
<b>Deficiency in work environment</b>	<ul style="list-style-type: none"> <li>● Sort unnecessary items in hospital (S1)</li> </ul>	<ul style="list-style-type: none"> <li>● Frequency of hospital cleaning</li> <li>● Frequency of hospital disinfection</li> <li>● Number of units of unused equipment</li> </ul>		
	<ul style="list-style-type: none"> <li>● Regular cleaning in hospital (S3)</li> <li>● Predetermined frequency, content, and assignment of hospital shine (S4)</li> </ul>			
	<ul style="list-style-type: none"> <li>● Regular disinfection in hospital (S3)</li> <li>● Predetermined frequency, content, and assignment of hospital disinfection (S4)</li> </ul>			
<b>Deficiency in waste disposal</b>	<ul style="list-style-type: none"> <li>● Unused equipment stored at designated places (S2)</li> <li>● Established rule to store unused equipment (S4)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of trash cans for sorting</li> <li>● Degree of understanding of contact network to be used in case of infection</li> </ul>		
	<ul style="list-style-type: none"> <li>● Established rule to clean contamination (S4)</li> <li>● Waste sorted, and discarded at designated places; established rules for waste disposal (S4)</li> <li>● Waste separated from general garbage before discard (S3,S4)</li> </ul>			

☆:Indicators that are already utilized in the existing JICA projects

Remarks: It is hard to distinguish the hospital infection from the community-acquired infection in the present African situation. Therefore, this approach could be utilized in the specific hospital infection, like in the surgical operation, at the initial stage of a project.

(3) Proposed logic for Improving Management of Pharmaceuticals and Equipment (Refer to Figure 12 and Table 20)

**【Basic way of thinking】**

Here we have broken down the causes for the poor management of pharmaceutical products, tools and equipment into the following five categories: the existence of “dead inventory”, “deficiency in inventory management”, “deficiency in management of order”, “shortages in the supply of drugs and equipment”, and “shortages in the purchasing budget”. Among these, the categories that may be dealt with by using the “5S-KAIZEN-TQM Approach” are the following three: the existence of “dead inventory”, “deficiency in stock management”, and “deficiency in the management of orders”. While “shortages in the supply of drugs and equipment”, and “shortages in the purchasing budget” are not included, they are prerequisite conditions for producing direct outcome 1.

For example, even if space is created from activities initiated for the “disposing of unneeded stock, such as stock that has expired” for the elimination of “dead inventory” and it becomes possible to “store other items that are necessary”, this is meaningless if there is no budget for purchasing the other necessary items, and even if there is a budget, it is not possible to produce results if the necessary new drugs and equipment may not be introduced due to shortages in supply or deficiencies in logistics. The same applies to items that are “out of stock”.

As an end outcome (intermediate outcome) of “improving the management of pharmaceutical products and equipment”, the three items, “effective use of drugs, tools and equipment”, “sustained efficiency for stock management procedures”, and “sustained efficiency for the management of ordering procedures” had been identified, with the representative indicators for each added to the diagram. As apparent from this information, if there is a certain level of funds for drugs, tools, and equipment, the budget savings that are created can also be used for buying new drugs or equipment. Therefore, for a hospital which has limitations in its budget, this also contributes indirectly for “reductions in medical accidents” and “prevention in hospital infection,” as well as serving as a measure to counter shortages in products and funds.

As issues in which the “5S-KAIZEN-TQM Approach” demonstrates its effects for the three end outcomes, we have identified “methods to reduce dead inventory”, “stock management methods”, and “methods for managing orders” as issues for which the “5S-KAIZEN-TQM Approach” demonstrates its effects for the three end outcomes.

**【Points to note】**

This is an item for which the impact of the “5S-KAIZEN-TQM Approach” can be produced in a significant manner. However, there is a strong initial sense of burden on the part of the person responsible, so it becomes necessary to provide top-down enforcement and periodical checking on whether the rules are adhered to. Furthermore, awareness in the person responsible on the purpose of the activity becomes his or her motivation to observe the rules, thus it is necessary that the objectives are shared through the impact level. It is particularly important that advance training is provided on the point that these activities will tie into the person’s own benefit as an end result.

This is the same as with other issues, if the official is clearly aware about the intermediate outcome as the common objective at the outset and develop the environment (“improving organizational capacity”) where the specific image and the means of achieving KAIZEN can be secured from the start of the 5S activities and acquire the method of reviewing work (“improving job quality”), an employee will voluntarily review his or her tasks in looking

toward further improvement, discover new issues, and continue to resolve such issues with different 5S activities.

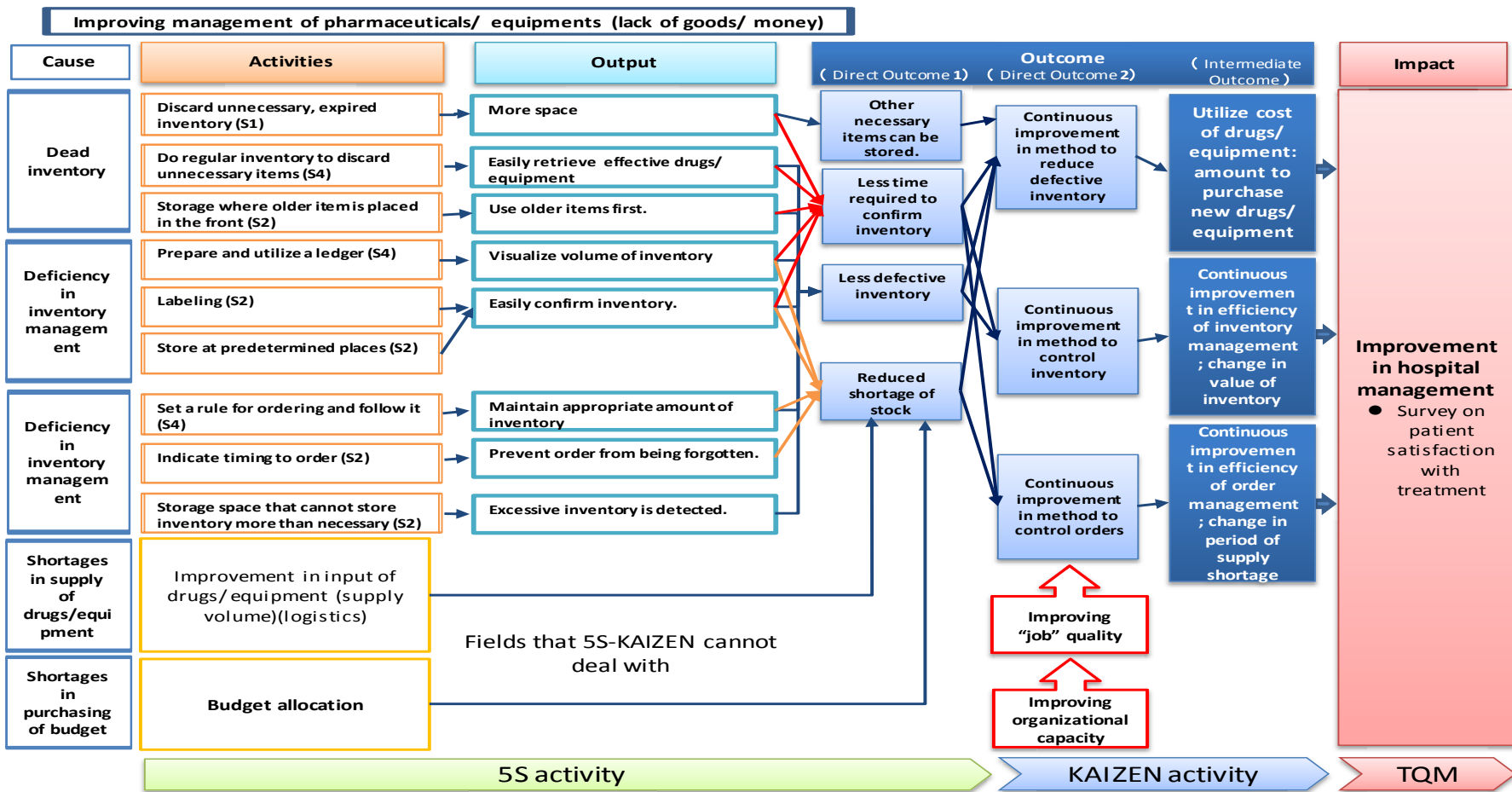


Figure 12 Proposed logic model for improving management of pharmaceuticals and equipment

**Table 20 Proposed indicators for logic model for improving management of pharmaceuticals and equipment**

Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact
<b>Dead inventory</b>	● Discard of expired inventory (S1)	● Amount of expired inventory discarded ● Frequency of inventory clearance ☆ Time required to procure items	Project purpose "Utilize cost of drugs/ equipment: amount to purchase new drugs/ equipment" ☆ Amount of inventory (\$/year) ☆ Cost of medical materials (\$/year)	<b>Impact</b> "Improvement of hospital management" ● Expense rate (%) (Expense/medical profit*100) ● Rate of medical material cost (%) (medical material cost/ medical profit*100) ● Amount of medical profit (\$) ● Survey on patient satisfaction regarding supply of drugs and medical devices
	● Regular inventory clearance (S4)			
	● Storage where older items are placed in the front (S2)			
<b>Deficiency in inventory management</b>	● Prepared, and utilized ledger (S4)	● Amount of expired inventory discarded ● Number of unlabeled drugs/ equipment ● Number of drugs/ equipment not stored at designated places ☆ Time required to procure items	"Continuous improvement in efficiency of inventory management" ☆ Amount of inventory (\$/year) ☆ Amount of expenses (\$/year) ☆ Cost of medical materials (\$/year)	
	● Labeled drugs/ equipment (S2)			
	● Drugs/ equipment stored at designated places (S2)			
<b>Deficiency in management of order</b>	● Established rule for ordering (S4)	☆ Number of days where drugs are out of stock ☆ Number of days where medical devices are out of stock ● Amount of expired inventory discarded	"Continuous improvement in efficiency of order management" ☆ Amount of expenses (\$/year) ☆ Cost of medical materials (\$/year)	
	● Work according to rule for ordering (S4)			
	● Established rule for ordering (cleanliness)			
	● Rule for ordering observed by staff (cleanliness)			
	● Labels to show timing of order (S2)			
● Storage place that cannot store inventory more than necessary (S2)				

☆:Indicators that are already utilized in the existing JICA

Remarks: Comparison of present data with those of the previous year can clarify gaps in case of using the data such as inventory, expenses and material costs. Dishonest activities can be detected in this way.

(4) Proposed logic for improving “job” efficiency (Refer to Figure 13 and Table 21)

**【Definition of “job”】**

“Job” refers to all the work conducted in health facilities. This is a large concept which for example includes not only the medical action but also the treatment of the patient, office work, cleaning operations and KAIZEN activities.

**【Basic way of thinking】**

Here we have broken down the causes for poor “job” efficiency into five categories: “deficiency in providing guidance for patients”, “deficiency in managing documentation”, “deficiency in managing equipment”, “lack of organizational capacity”, and “shortages in human resources and budgets”. Among these, the categories that may be dealt with by using the “5S-KAIZEN style approach” are the following four: “deficiency in providing guidance for patients”, “deficiency in managing documentation”, “deficiency in managing equipment”, and “insufficient organizational capacity”. While “shortages in human resources and budgets” is not included, it is a prerequisite condition for producing the end outcome (intermediate outcome).

In other words, this means that when a certain amount of resources (people, funds) are set as prerequisites, in order to improve the end outcomes in a sustainable manner, there are limitations to the “5S-KAIZEN-TQM Approach”, and after improvements have been mostly completed with the human resources and budgets that are presently available, the input of new human resources and budgets will become necessary for further improvement. However, in terms of pure job efficiency, significant improvements may be expected with this approach alone, so when a point is reached at which the state of “shortened waiting time for patients” and the “working hours of employees” become worse due to reasons such as further increases in the number of patients, then it is probably time to consider the input of new human resources and budgets.

As an end outcome, the three items, “patient waiting time”, “working hours for employees”, and “errors that are made in work” have been set for improvement with the representative indicators for each, and added to the diagram.

“Patient guidance methods”, “document management systems”, and “equipment management systems” have been identified as examples of issues for which impact will be seen in the three end outcomes with the “5S-KAIZEN-TQM Approach”. In a similar way as with the case of medical accidents, as long as employees share the objectives which had been identified as the three end outcomes, or the higher objectives, and they have received training in KAIZEN (“improving organizational capacity”) and the methods for reviewing their tasks (“improving job quality”), they will more easily conduct reviews voluntarily for further improvements, find new issues, and resolve those issues using other 5S activities. What is characteristic here is that the “deficiency of organizational capacity” has been identified separately from “improving organizational capacity”, which is set as a prerequisite for intermediate outcomes.

The reason for this is that when considering “job” efficiency, it is believed that within an organization, “irregularity in work”, particularly among people, becomes a critical element. “Irregularity in work” refers to cases such as those in which an employee refrains from doing work as they sit or stand next to a busy colleague, believing that it is not their job. Most of these cases involve people who do not understand the objectives of their organization and fix their own territories in a small way. Thus, this part has been extracted as an addition to this content, since it becomes an important factor for realizing all outcomes to have employees share the

objectives of the organization through periodical training for everyone and making a habit of helping each other out in work activities that are undertaken in small groups.

**【Point to note】**

While it may appear as if improvements have been realized for “patient waiting time” and reductions in the “working hours of employees” for enhanced “job” efficiency, care must be taken when checking the indicators, since the doctor consultation time for each patient may have been shortened, and there are possibilities that the quality of health care services might drop or the number of patients decline. It also becomes necessary to simultaneously establish and check the indicators at the impact level.

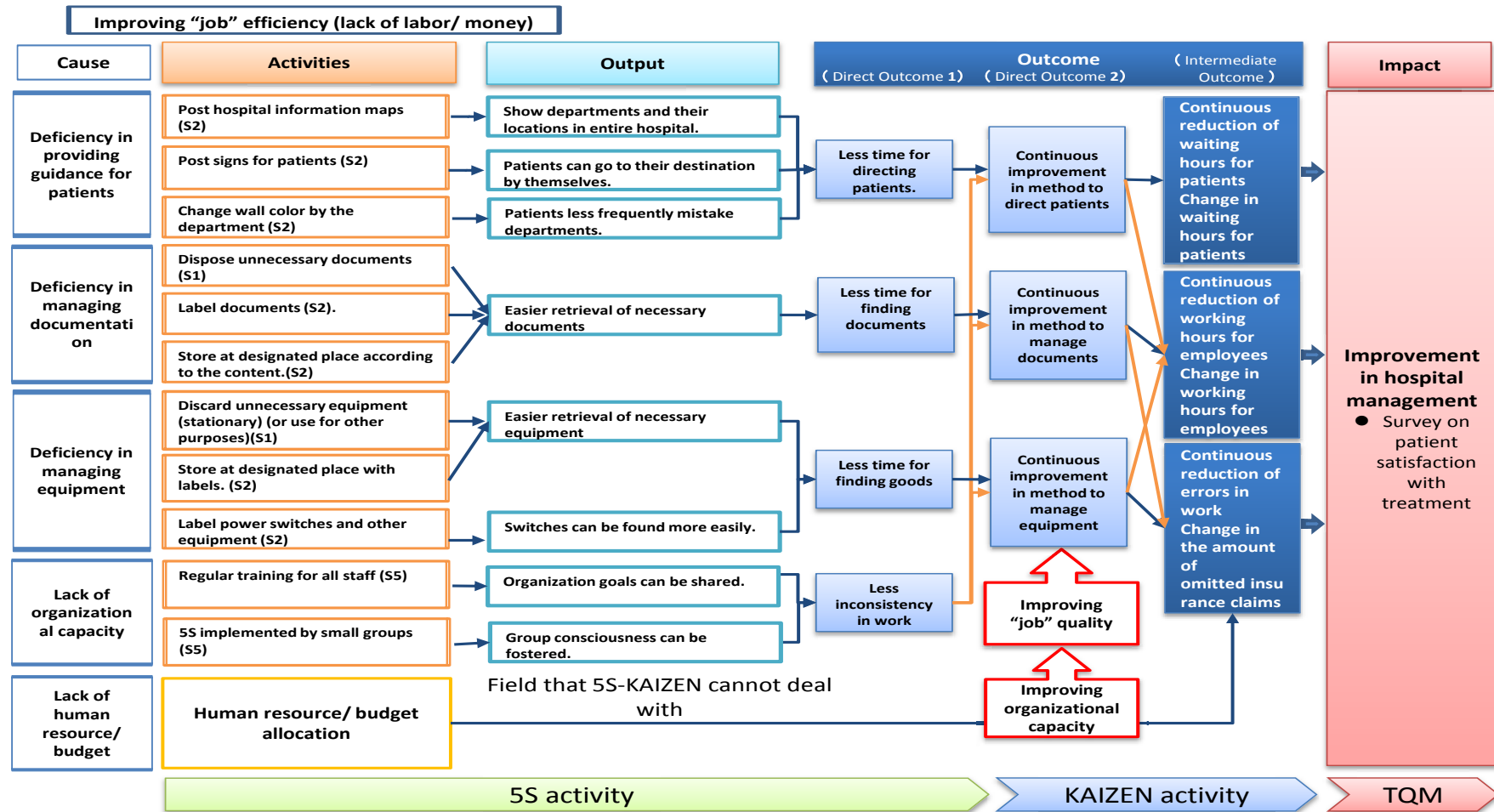


Figure 13 Proposed logic model for improving "job" efficiency



**Table 21 Proposed indicators for logic model for improving “job” efficiency**

Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact
<b>Deficiency in providing guidance for patients</b>	● Hospital information maps posted (S2)	<ul style="list-style-type: none"> <li>● Number of inquiries on guidance from patients</li> <li>● Number of patients given guidance</li> <li>● Number of improvements in hospital signs</li> </ul>	Project purpose “Continuous reduction of patient waiting hours” <ul style="list-style-type: none"> <li>● Number of outpatients (per year)</li> <li>● Number of inpatients (per year)</li> <li>● Period where a patient stays in hospital (time/head)</li> <li>● Profit from outpatients (per year)</li> <li>● Profit from inpatients (per year)</li> </ul>	<b>Impact</b> <b>“Improvement of hospital management”</b> <ul style="list-style-type: none"> <li>● Number of staff per patient (Number of staff/ number of patients)</li> <li>● Profit per inpatient (\$/head) (Profit from inpatients/ number of inpatients)</li> <li>● Profit per outpatient (\$/head) (Profit from outpatients/ number of outpatients)</li> <li>● Medical profit per bed (\$/bed) (Profit/number of wards)</li> <li>● Rate of labor cost (%) (Total salaries/medical profit)</li> <li>● Profit per employee (\$/head) (medical profit/ number of staff)</li> <li>☆ Patient satisfaction (provision of hospital information)</li> <li>☆ Patient satisfaction (period of hospital stay)</li> <li>☆ Staff satisfaction (work environment)</li> </ul>
	● Signs for patient induction posted (S2)			
	● Ingenuity such as wall color changed by the department (S2)			
<b>Deficiency in managing documentation</b>	● Disposal of unnecessary documents (S1)	<ul style="list-style-type: none"> <li>● Number of missing documents</li> <li>☆ Time required to retrieve documents</li> </ul>	“Continuous reduction of staff working hours” <ul style="list-style-type: none"> <li>● Average overworking hours (hour/head)</li> <li>● Labor cost (per year)</li> </ul>	
	● Labeled documents (S2)			
	● Documents stored at designated place according to the content (S2)			
	● Documents stored at designated place (S4)			
<b>Deficiency in managing equipment</b>	● Discard of unnecessary equipment (stationary) (or use for other purposes) (S1)	<ul style="list-style-type: none"> <li>● Number of unnecessary devices used for other purposes</li> <li>● Number of missing devices</li> <li>● Time required to retrieve devices</li> </ul>	“Reduction of errors in work” <ul style="list-style-type: none"> <li>● Number of improvements in work (per year)</li> </ul>	
	● Equipment stored at designated place with labels (S2)			
	● Signs indicating places to store equipment (S2)			
	● Labeled power switches and other equipment (S2)			
<b>Lack of organizational capacity</b>	● Regular training for all staff (S5)	<ul style="list-style-type: none"> <li>● Frequency of training</li> <li>● Total number of staff/ divisions participating in training</li> <li>☆ Scores of proficiency test after training</li> <li>● Number of staff/ divisions participating in small group activity</li> <li>● Number of reports on implemented small group activity</li> <li>● Frequency of briefing sessions on small group activity</li> </ul>		
	● 5S implemented by small groups (S5)			

Note: The intermediate outcome of “average working hours” and “labor cost” need confirmation whether payment is made when overtime hours are accurately reported.

☆: Indicators that are already utilized in the existing JICA projects

(5) Proposed logic for improving “job” quality (Refer to Figure 14 and Table 22)

**【Definition of improving quality of ”job”】**

We have defined this as “activities to continuously reduce irregularities that are caused by people across all jobs”. These are activities for process quality control as set forth in JIS8101-2:1999 to “reduce and maintain the characteristic dispersion in goods or services which are the outputs of processes, to push forward improving procedures and standardization, and to accumulate skills along the way”, which we have defined in our response. This definition by the JIS includes services, and it is fair to say that the point that it raises in the activity process for process improvement, standardization, and the accumulation of skills is a match with the improvement methods for work in KAIZEN activities, and is thus appropriate as a definition.

**【Basic way of thinking】**

As reasons for poor quality of job at the front lines of health care, we have identified four categories: “deficiency in operation standard”, “deficiency in familiarization of operation standard”, “deficiency improving operation standard”, and “poor quality of medical skills”. Out of these, the first three are areas which can be dealt with by using the “5S-KAIZEN-TQM Approach”, and “poor quality of medical skills” has not been included.

The majority of the activities here are those at the KAIZEN level, and the major prerequisites are receiving training in KAIZEN ahead of time and mastering the methods for developing work flow, and using these to improve work procedures.

“Close calls” that take place during these activities refer to tasks in which accidents or failures have not actually happened, but such incidents may have taken place if other negative conditions had been compounded. By analyzing their causes and making changes in work methods so that similar conditions do not occur, it will become possible to create safer and more logical methods of work.

By sustaining activities such as those that have been given here as examples and controlling the irregularities or variances in services that are provided by people, it will become possible to improve the quality of service (work) at hospitals as a whole and realize stable, sustainable improving the areas earlier mentioned from 1) through 4).

**【Points to note】**

Training in KAIZEN entails the introductory teaching of what exactly “impossible, irregularities, and excess” mean, providing, in particular, instruction on the meaning of “excess” in a simple manner (specific examples will be provided under “Topics” at the end of this chapter), and to present simple formulas for improvement such as putting 5W into practice, which method repeats asking the question of ”Why” five times in order to find out the real cause of the “excess” or ECRS meaning Eliminate, Combine, Re-arrange, Simplify, hereinafter referred to as “ECRS,” which explains the order or priority in which to consider the improvement of jobs<sup>34</sup>, as well as by presenting examples of improvement<sup>35</sup>.

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<sup>34</sup> “The Best Way to Advance the KAIZEN”, 2007; Osamu Shinoda, Japan Management Association Management Center

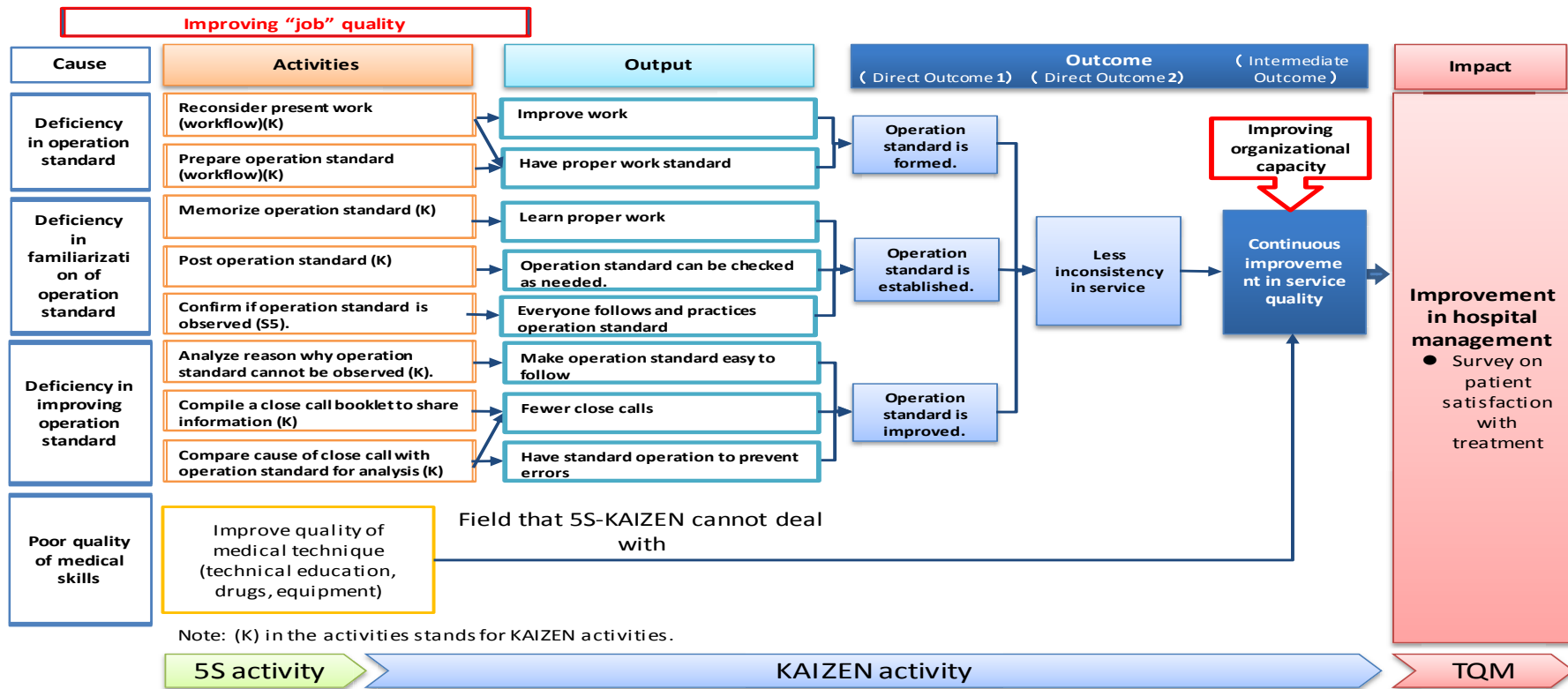
<sup>35</sup> “The Best Way to Advance the KAIZEN”, 2007; Osamu Shinoda, Japan Management Association Management Center

There is a need to take care in so doing, as analysis methods that use statistics and arithmetic or fish bones such as the seven tools in QC<sup>36</sup> are not necessary in the early stages, and may instead give the impression that KAIZEN is something difficult.

A common occurrence that often indicates the stagnation of activities is finding that reviews of operation standards and revisions have not been taking place for long periods of time. This is proof that the operation standards had only been created, and have not been put to actual use. Rather than simply checking items such as QIT check items and reviewing just the “figures for revised operation standards”, it is also necessary to confirm whether there might be operation standards that have not been revised for long periods of time, and to conduct research to see if they are actually being used.

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<sup>36</sup> “QC Seven tools at Workplace. No. 5” Oba, Japan Science and Technology Federation, 1985



**Figure 14 Proposed logic model for improving "job" quality**

**Table 22 Proposed indicators for logic models for improving “job” quality**

Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact
<b>Deficiency in operation standard</b>	<ul style="list-style-type: none"> <li>● Review of present work (workflow) (K)</li> <li>● Prepared operation standard (workflow) (K)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of revisions in operation standard</li> <li>● Number of briefings to review operation standard</li> <li>● Number of issues of operation standard prepared</li> <li>● Number of divisions that have prepared operation standard</li> </ul>	Project purpose Standardization of service quality <ul style="list-style-type: none"> <li>● Number of malpractices/ medical negligence/ accidents (per year)</li> <li>● Number of hospital infections (per year)</li> </ul>	<b>Impact                      “Improvement of hospital management”</b> ☆Occupancy rate of hospital beds (%) <ul style="list-style-type: none"> <li>● Number of patients referred from other hospitals (per year)</li> <li>☆ Number of medical treatments (per year)</li> <li>☆ Patient satisfaction (medical treatment)</li> <li>☆ Staff satisfaction (work efficiency)</li> </ul>
<b>Deficiency in familiarization of operation standard</b>	<ul style="list-style-type: none"> <li>● Operation standard understood by staff (K)</li> <li>● Operation standard posted (K)</li> <li>● Compliance with operation standard confirmed (K)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of divisions posting operation standard</li> <li>● Number of patrols/ confirmations by QIT etc</li> <li>● Number of briefings by divisions using operation standard</li> </ul>		
<b>Deficiency in improving operation standard</b>	<ul style="list-style-type: none"> <li>● Analysis of reason for non-compliance with operation standard (K)</li> <li>● Preparing/ sharing a collection of close calls (K)</li> <li>● Comparing/ analyzing causes of close calls with operation standard (K)</li> </ul>	<ul style="list-style-type: none"> <li>● Preparation of a collection of cases by QIT</li> <li>● Number of divisions where a collection of cases is distributed</li> <li>● Number of briefings by divisions using operation standard</li> <li>● Number of convened workshops to study cases in hospital</li> </ul>		

☆:Indicators that are already utilized in the existing JICA projects

Remark: Frequent reviews and revisions of the standards are important to maintain the quality of “job” at a high level. Therefore, checking if there is any non-revised standard for long period is important as well.

(6) Proposed logic for Improving Organizational Capacity (Refer to Figure 15 and Table 23)

**【Basic way of thinking】**

Here, we have identified the following four items as the reasons for weak organizational capacity: the “lack of information”, the “lack of experience”, “deficiency in system”, and the “lack of leadership in leaders”. Among these, the first three are items that may be dealt with by using the “5S-KAIZEN-TQM Approach”, while the “lack of leadership among leaders” has not been included.

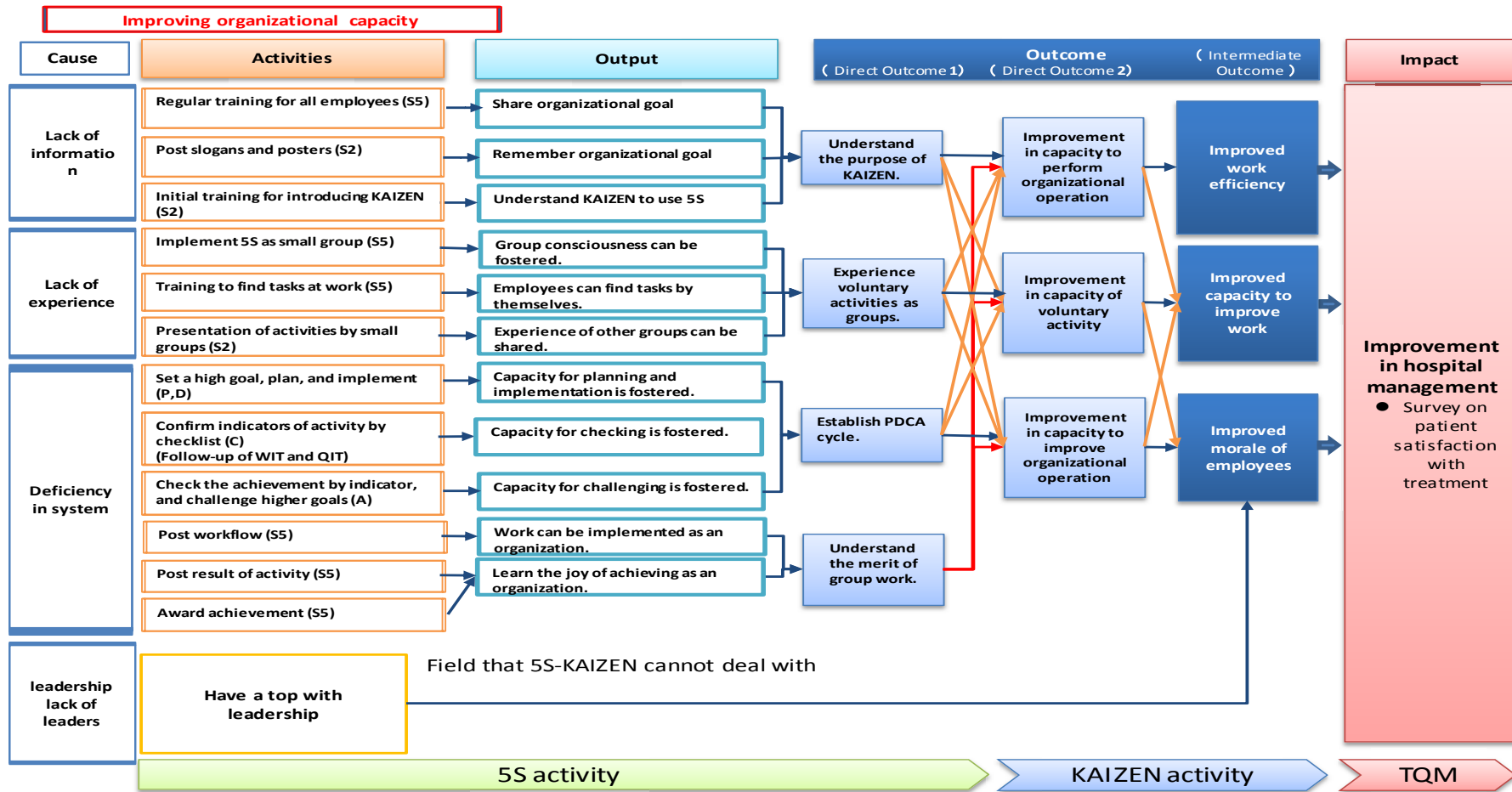
The “improvement of job efficiency”, the “enhancement of the capacity to bring about business improvements, and the “improving employee morale” have been identified as end outcomes (intermediate outcomes) for boosting organizational capacity, and for these three end outcomes, we have elected to discuss the “organizational capacity to execute business activities”, the “ability to engage in voluntary activity”, and the “organizational capacity to improve business duties” as outcome 2 for each, as issues for which the “5S-KAIZEN-TQM Approach” will demonstrate their impact. The reason why “improving organizational capacity” has been included as a prerequisite for all the items from 1) through 5) is that this intermediate outcome 2 capability is a crucial ability for the sustainable improvement of the other items. This is because the essence of KAIZEN is to voluntarily find an issue and proceed in creating an improvement plan (P), taking action (D), checking the results (C), and linking these to the next action in heading toward a higher objective (A), and repeating this management of Plan, Do, Check, Action, (hereinafter referred to as “PDCA cycle”) endlessly, like a spiral. Another important element of KAIZEN activities is that by engaging in this cycle as a group, it becomes possible for an individual to understand the work of those around him or her and implement measures for improving a way that does not fall under the category of partial optimization, thereby eliminating the issues of “impossible, irregular, and excess” at work.

**【Point to note】**

Depending on the country, there are often cases in which group activities are met with rejection due to reasons such as a “difference in culture”. However, in most cases, the real reason for this is a lack of experience. It is necessary to allow employees to first experience success in a group activity for some minor issue, rather than taking a top-down approach of enforcement in which the management of the hospital will take the lead.

In order to enhance organizational capacity, the “leadership qualities of leaders” is indispensable. This has such strong impact that if a leader who has leadership qualities does not offer full support for the “5S-KAIZEN-TQM Approach” and take initiative in providing understanding and support for activities, then all activities will stagnate and eventually return to the previous state. Thus, in revitalizing and expanding activities, it will become a critical point that the hospital head, as well as those who are candidates for future leadership, receive training and undergo workshops concerning leadership.

This has been demonstrated in the fact that “Program of TQM for Better Hospital Services”, which was the subject of this survey, conducting training for hospital heads, assumed an important role in introducing the Approach in each hospital in order to achieve the outcome for the entire project.



**Figure 15 Proposed logic model for improving organizational capacity**

**Table 23 Proposed indicators for logic models for improving organizational capacity**

Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact
Lack of information	● Regular training for all staff (S5)	● Number of trainings ● Number of staff/ divisions participating in training	Project purposes Improved work efficiency ● Average hours of overwork (hour/head) ● Labor cost (\$/year)	Impact "Improvement of hospital management" ● Number of staff per patient (Number of staff/ number of patients) ● Profit per employee (\$/head) (medical profit/ number of staff) ☆ Patient satisfaction (Staff service) ☆ Staff satisfaction (morale, work efficiency)
	● Posted slogans and posters (S2)	☆ Score of proficiency test after training ● Test to check level of recognition on organization goal		
	● Initial training to introduce KAIZEN (S5)	☆ Score of 5S/ KAIZEN proficiency test		
Lack of experience	● 5S activity by small groups (S5)	● Number of staff/ divisions participating in small group activity	Improved capacity to improve work ● Data on cases of achievement ● Total number of staff participating in training (per head) ● Change in scores of proficiency test after training (points)	
	● Training to find problems at work (S5)	● Number of reports on implemented small group activities ● Number of presentations on small group activities		
	● Presentation of activities by small groups (S5)	● Number of staff/ divisions participating in training		
Deficiency in system	● Set a high goal, plan, and implement (Plan, Do)	● Number of plans ● Number of planning divisions ● Number of convened regular meetings	Improved morale of employees ● Number of staff/ divisions participating in small group activity (per year) ● Number of staff leaving work (per year) ● Number of absences without permission/ tardies (per month) ● Number of years in work (year/month)	
	● QIT confirms the result of WIT activities by checklist (Check)	☆ Number of checks by QIT		
	● Confirm the result using indicators, and challenge higher goals (Action)	☆ Number of monitors by senior staff ● Number of convened regular meetings		
	● Post workflow (S5)	● Number of divisions posting workflow		
	● Post result of activities (S5)	● Number of divisions posting result ● Number of achieved goals		
	● Award result of activities (S5)	● Number of presentations on results ● Number of divisions presenting results ● Number of awards for results ● Number of divisions to be awarded		
			☆:Indicators that are already utilized in the existing JICA projects	

Note: The intermediate outcome of "average working hours" and "labor cost" need confirmation whether payment is made when overtime hours are accurately reported.



#### (7) Indicators

Indicators have been proposed and presented in detail in Tables 18 through 23, according to the levels for logic, in line with the various issues as mentioned above. There are indicators in the table which have not confirmed the actual record of collecting in the covered 15 countries. Therefore, the indicators which have already acquired data in programs related to the “Program of TQM for Better Hospital Services” implemented in the fifteen countries or which have at least been established as indicators have been marked with a star (☆).

As for the super goals, the financial indicators for the individual hospitals and their patient satisfaction levels have been established. As to the financial indicators for individual hospitals, while data may not be acquired for all hospitals at present, there were cases among the “Program of TQM for Better Hospital Services” for which despite the fact that they were not indicators, revenue and expenditure data had been obtained, which have been marked with a star (☆).

At the impact level, we have provided indicators related to surveys on patient satisfaction levels (with regard to hospital facilities, medical treatment, cleanliness, ease of layout in getting around the hospital, and the appropriateness of responses by staff) concerning each of the issues that are improved through the implementation of the “5S-KAIZEN-TQM Approach”, as well as on surveys of employee satisfaction levels (willingness to work, work efficiency), increase in hospital services (number of referrals from other facilities, the number of medical treatments, the revenues from medical operations) and increases in hospital revenue (number of patients, number of patient referrals from other institutions, number of medical treatments, amount of revenue from medical practices), the efficiency of expenditures (usage ratios for hospital beds, expense ratios, ratios of medical supplies, number of employees per patient, revenue per inpatient, revenue per outpatient, revenue from medical practices performed per bed, ratios for labor costs, revenue per employee).

At the outcome level, we have established business indicators related to each of the individual project purposes according to objective.

At the output level, we have established a point system evaluation item that uses a check sheet in a similar manner as those used in the Asia-Africa Knowledge-Co-creation Program (AAKCP) and in related projects in locations such as Tanzania and Senegal for measuring the direct outcomes of 5S activities.

These indicators have been put together in the attachment 6 so that they may be examined from a broader angle. When looking at them in their entirety, it will become evident that as opposed to the high rate of indicators which are already used at the impact level, there are a smaller numbers of those that are used as indicators in the step prior, as intermediate outcomes and direct outcomes for the shaping of future projects, and it is desirable to increase the number of indicators at the mid-range level.

#### (8) Prerequisite conditions, promotional factors, and inhibiting factors

The prerequisite conditions, promotional factors, and inhibiting factors which are unique to the various issues have been made clear in our descriptions of logic models according to issue. Here, we will reveal the prerequisite conditions, promotional factors, and inhibiting factors that all issues share in common.

### **【Prerequisite conditions】**

As prerequisite conditions for the commencement of the “5S-KAIZEN-TQM Approach”, we identify the following three points:

- (1) Hospital head has awareness of the issues that can and cannot be resolved with the “5S-KAIZEN-TQM Approach”.
- (2) Hospital head is aware of the issues that are faced by the hospital, has strong desires to resolve such issues, and has a strong sense of commitment for the projects.
- (3) The local side has a specific and clear understanding of the fact that at the time of commencement of activities, KAIZEN is a voluntary and continuous activity, and that 5S is one of its tools.
- (4) Indicator data available for continuous collection already exists, or else it is possible to establish alternative indicators.

### **【Promotional factors】**

The promotional factors following the output stage are that the following three items:

- (1) It is possible to obtain technical support from donors and government organizations.
- (2) Tenacious activity will be undertaken by hospital directors and QIT; individuals will stand at the front lines and push the promotion of activities forward.
- (3) The activities will employ a method to start small on a pilot scale, and accumulate successful cases.

The factors that may be identified beyond the outcome level are:

- (1) The ability of hospital related personnel to regularly receive training which matches the progress of activities.
- (2) The ability to obtain simple text concerning KAIZEN-TQM.
- (3) Sharing activities between departments.
- (4) Involving field experts inside the hospital such as doctors in the activities.
- (5) Hearing positive feedbacks on favorable reputations from patients and external sources.

### **【Inhibiting factors】**

The promotional factors beyond the output stage are:

- (1) Not being able to allocate funds from the budget for purchasing the equipment and resource materials necessary for the activities.
- (2) The existence of employees who are not cooperative concerning the activities.
- (3) Outcome at the hospital not being justly evaluated by upper organizations such as Ministry of Health.

The following are beyond the outcome level:

- (1) KAIZEN training is not provided in the early stages, and the objectives for the activities stop at the 5S level
- (2) It is not possible to receive periodical training
- (3) Staff may be transferred or terminate their employment in mass
- (4) The inability to obtain data for performance indicators

All KAIZEN activity will saturate and decline if nothing new is done. Thus, the ultimate promotional factor is in continuing to circulate the PDCA cycle with “continuous activity and training”. For that, it is necessary for the local human resources alone to acquire the skills to “voluntarily discover issues” through the “visualization of issues”. However, attention is needed when in developing regions such as Africa, as there are many cases in which there are lacks in the prerequisite conditions for activities, such as social infrastructure, human resources that offer training, and budgets. There is concern that the results of direct support for such shortages

in resources may very well become elements that delay their voluntary activity, and we will conclude by saying that the shortcut for guiding the “5S-KAIZEN-TQM Approach” to success is to make considerations when projects are first formed for the methods for offering support, and the timing and project durations in accordance with the conditions of each of the countries.

## Annex

## Annex 1. List of survey schedule

Survey in Japan Nov. 2012- Jan. 2013	<ol style="list-style-type: none"> <li>1. Review documents and reports</li> <li>2. Interview to Japanese experts</li> <li>3. Participation in the preparatory meetings</li> </ol>
Field survey in Tanzania 12-26 Jan, 2013	<ol style="list-style-type: none"> <li>1. Dar es Salaam MOHSW, Mhinbili Hospital, JHPIEGO, U.R.C</li> <li>2. Iringa region Tosamaganga Hospital, Regional Health Management Team (RHMT)</li> <li>3. Mbeya region Mbeya Consultant Hospital, Mbeya Regional Hospital, Mbalizi Hospital, RHMT, GIZ,</li> </ol>
Field survey in Senegal 28-Jan - 10-Feb, 2013	<ol style="list-style-type: none"> <li>1. Dakar MOH, Family Health International(FHI), Gaspard Camara Health Center, Grand-Yoff Hospital, JICA Project for Reinforcement of maternal health, JICA Project for Reinforcement of Health System Management</li> <li>2. Thies region Thies Hospital</li> <li>3. Tambacounda region Tambacounda Health Center, Tambacounda Regional Hospital, Kotiary Health Post, Regional Health Service</li> </ol>
Summarization Feb-Jun, 2013	<ol style="list-style-type: none"> <li>1. Review documents</li> <li>2. Participation in the reporting meetings</li> <li>3. Making final reports and presentation materials</li> </ol>

## Annex 2. List of the persons met in the survey

Title	Person
Japan	
National Center for Global Health and Medicine	Dr. Noriaki IKEDA
Fujita Planning Co., Ltd.	Mr. Shuichi SUZUKI
Nippon Medical School	Dr. Toshihiko HASEGAWA
Tanzania	
<b>Ministry of Health &amp; Social Welfare</b> Director Health Quality Assurance,	Dr. Mohamed Ally Mohamed
<b>Ministry of Health &amp; Social Welfare</b> Head, Health Services Inspectorate Unit	Dr. Henock A.M. Ngonyani
Advisor of Ministry of Health & Social Welfare JICA expert	Mr. Hisahiro ISHIJIMA
<b>Ministry of Health &amp; Social Welfare</b> Hospital Reform officer	Ms. Romana F. Sanga
<b>Muhimbili National Hospital</b> Director of Human Resources, Manager Quality Improvement Unit.	Mr. Makwaia M. Makani Ms. Regina Kiwoli Nyambo
<b>University Research Co., LLC.</b> Senior QI advisor Senior QI advisor	Mr. David J. KIHWELE Ms. ELIZABETH C.U. HIZZA
<b>JHPIEGO</b> Infection Prevention Advisor	Mr. Albert Komba
<b>Regional Health Management Team, Iringa</b>	Dr. Manyama Deogratias
<b>Tosamaganga Designated District Hospital</b> Chief QIT QIT QIT assistant HMT QIT	Dr. Lazaro Mtuya Mr. Lowrence Mhaluka Dr. Leonard Merere Mr. Angelo Mbuki Ms. Isse Nsehhu Ms. Velonica Kihuero
<b>Mbeya Consultant Hospital</b> Director General JOCV QIT secretary QIT QIT QIT QIT QIT QIT	Dr. Eleuter Roki Samky Mr. Yoshiharu KAMATA Ms. Adela Mrula Ms. An Mtandi Mr. R. Dibogo Ms. Ruth Shadrack Mr. Esther Kaseko Mr. Humphrey Kiwelu Mr. Thomas Isdory / QIT
<b>Mbeya Regional Medical Office</b> Regional Medical officer Regional Nursing officer Regional Pharmacist Regional Lab Technologist Regional Mental Health GIZ-TGPSH	Dr. Agnes Buehwa Ms. Lydia Mbembela Ms. Lucia F. Mkumbo Mr. Ezekiel Tuya Mr. Jordan Nyenyembe Mr. Johanenes Schwed

<b>Mbeya Regional Hospital</b> Director Matron	Dr. Lewis Kallist Chomboko Ms. Anna J. Otaru (Other 16 QIT/HMT members)
<b>Mbeya Regional medical office</b> Regional Medical officer Regional Nursing officer Regional Pharmacist Regional Lab Technologist Regional Mental Health GIZ-TGPSH	Dr. Agnes Buehwa Ms. Lydia Mbembela Ms. Lucia F. Mkumbo Mr. Ezekiel Tuya Mr. Jordan Nyenyembe Mr. Johanenes Schwed
<b>Council of Health Management Team, Mbeya</b> Council Medical Officer LAB&ASSESSMENT Public health officer	Ms. Jescar Msebeni Ms. Georgina Mwingwa Mr. Edao J. Kyara
<b>Mbalizi Hospital</b> Director General	Dr. Msafiri Kimaro (Other 26 QIT/HMT members)
Senegal	
<b>Ministere de la Sante et de la Prevention</b> Program Coordinator Technical advisor	Dr. Ndella KONATE Dr. Mari NAGAI
<b>Ministere de la Sante et de la Prevention</b> Responsible SIM/DES (Quality division chief )	Mr. Ousmane Dia
Project for Reinforcement of Health System Management in Tambacounda and Kedougou Leader	Mr. Shogo KANAMORI
Project for Reinforcement for Maternal and New Born Health Care Phase 2 Leader	Dr. Yasuo SUGIURA Ms. Miho GOTO
<b>Tambacounda Regional Hospital</b> Director Quality director, bio-medical technician President comite de 5S, nurse	Dr. Niasse Eheikh Ms. Khadi Kane Mr. Mamadou Feye
<b>Tambacounda Regional Health Service</b> Supervisor SSP In charge of partnership	Mr. Dame Fall Ms. Aissatou Sall
<b>Kotiary Health Post</b> Chief nurse, ICP JOCV, nurse	Mr. Boubacar Diallo Ms. Yuki SATO
<b>Tambacounda Health Center</b> Director	Dr. Amadou Mbaye DIOUF
<b>Thies Regional Hospital</b> Director Chief of Quality , Hygiene, and Security Responsible quality in QHS Information Information TMH JOCV	Mr. Babakar MANE Mr. Ablaye Diop Ms. Fatouma Dieng Mr. Samba Diaye Mr. Aly Mar Aioum Talla Ndiage Ms. Kaori KANETA

<p><b>Gaspard camara Health Center</b>  Director  Health care supervisor  in charge of Health Education  District Health Reproduction Activity Coordinator  Extended Vaccination Program  Mid-Wife Manager  Sanitary Engineering Responsible Technician, 5S  Focal Point Quality Chief  Bloc Major, 5S collaborator:  New born child service  Social service responsible</p>	<p>Dr. Ndeye Magatte NDIAYE  Ms. Aissatou DIEDHIOU  Ms. Aminata BA  Ms. Aissatou NIANG   Ms. Arame DIASSE  Ms. GASSAMA   Mr. Jacques SOW  Ms. Ibrahima FALL  Mrs. BA  Mrs. Gueye Datt DIOP</p>
<p><b>Grand Yoff General Hospital</b>  Director  Head of Lab, Head of Hospital Quality Cell</p>	<p>Dr. Moussa DAFF  Ms. Mme NIANG</p>
<p><b>Family Health International</b>  Technical Counselor  Country Director  Technical Director</p>	<p>Dr. Karim SECK  Dr. Barbara SOW  Dr. Abdoulaye Cire ANNE</p>



### **Annex 3. List of reviewed documents**

1. Reports and PDMs related to the African projects
  - a. Asia-African Knowledge Co-creation Program Group1 (2007~2013)  
Mid-term reports, Final reports
  - b. Asia-African Knowledge Co-creation Program Group2 (2009~2013)  
Mid-term reports, Final reports
  - c. Project for Strengthening Development of Human Resource for Health (Tanzania)  
PDM, Mid-term evaluation report  
Implementation Guideline for 5S-CQI-TQM Approaches in Tanzania  
The Tanzania Quality Improvement Framework in Health Care 2011-2016
  - d. The Project for Improving Maternal, Newborn and Child Health in the Lagos State (Nigeria)  
Ex-Ante Evaluation
  - e. The Project for Strengthening Capacities of Prince Régent Charles Hospital and Public Health Centers in Bujumbura City for Improvement of Mother and Child Health (Burundi)  
Ex-Ante Evaluation  
Mid-term evaluation report  
Final evaluation report
  - f. Project for Reinforcement of Health System Management in Tambacounda and Kedougou (Senegal)  
PDM, Progress report in the 1st year, Progress report in the 2nd year
  - g. Project on Improvement of Health Service through Health Infrastructure Management (Uganda)  
Ex-Ante Evaluation
  - h. Technical Advisor to the Secretary General of the Ministry of Public Health (Democratic Republic of the Congo)  
Report on the Support to Human Resource Development in health sector of DRC
  - i. Adviser of Continuous Maternal and Child Health Care (Morocco)  
Approval Sheet, Report from the Advisor
  - j. Maternal and Child Health Care Phase 2 (Morocco)  
The brochure, the report by the expert
  - k. Expert on 5S-KAIZEN-TQM for Hospital Management (Malawi)  
Application Forms for JICA technical cooperation
  - l. Asia-African Knowledge Co-creation Program(AAKCP) Lessons-learned and Proposals (JICA, May, 2011)
  - m. Preparatory Survey on the Program of Quality Improvement of Health Services by 5S-KAIZEN-TQM (JICA, June, 2012)
  - n. Preparatory Survey on the Program of Quality Improvement of Health Services by 5S-KAIZEN-TQM (JICA, 2011)
  - o. Preparatory Survey on the Program of Quality Improvement of Health Services by 5S-KAIZEN-TQM Final Report (JICA, March, 2013)
2. Other reports
  - a. Tomoko KAWAKAMI, The logical sense in the introduction of the TOYOTA production system into medical services (Kansai Univ. Shogaku Ronso, December, 2011)
  - b. Donald M. Berwick, CURING HELATH CARE ( 1990)
  - c. Donald M. Berwick, CURING HELATH CARE – Challenge to the new medical system (Nakayama Shoten, 2002)
  - d. Study on the organizational management by TQM in the medical sector (JICA, 2006)

- e. The General Policy of the promotion of the Medical Safety (Ministry of Health, Labour and Welfare, 2005)
- f. Managerial Check Sheet (Welfare And Medical Service Agency)
- g. 5S Activity in IWATA CITY HOSPITAL (IWATA City Hospital, 2012)
- h. 5S in the medical field to prevent mistakes and accidents (JIPM Solution, 2011)
- i. Endless Challenge to medical safety (ELSEVIER JAPAN, 2005)
- j. Seiichi IESATO, An Observation to TQM Introduction into Hospital Management (Sanda Shogaku Kenkyu 49-5, December, 2006)
- k. Toshihiko Hasegawa, Wimal Karandagoda “Change Management For Hospitals” (2011)
- l. Nimnath Withanachch, Wimal Karandagoda and Yujiro Handa “A performance improvement programme at a public hospital in Sri Lanka: an introduction”
- m. Yukio KAKIUCHI “KZ method”factory improvement (Japan Management Consultants Association ,2008)
- n. Teisuke KITAHARA, Tokisuke NOHMI “From TQC to TQM” (Yuhikaku Publishing Co., Ltd. ,1991)
- o. Yasuhiro MONDEN ”New TOYOTA system” (Kodansha, Ltd. , 1991)
- p. Osamu SHINODA ”The best way to advance “KAIZEN” “ (JMA Management Center Inc., 2007)
- q. Quality Improvingfection Prevention and Control Orientation Guide for Participants 2009
- r. Japan Medical Association “A manual for the medical safety” (2007)

#### **Annex 4. List of collected materials in the survey**

##### Tanzania

1. "The organization structure of the Ministry of Health and Social Welfare"
2. "Human resource for health strategic plan 2008-2013"
3. "The Tanzania Quality Improvement Framework in Health Care 2011-2016"
4. "Implementation of Guideline for 5S-CQI-TQM approaches in Tanzania"
5. "Training module on management of district and regional referral hospitals"
6. "Hospital Reforms Progress Report July 2011-Dec 2012"
7. "PROGRESS REPORT ON 5S-KAIZEN (Haydom Lutheran Hospital) "
8. JHPIEGO brochure
9. "MONITORING AND EVALUATION SHEET FOR THE PROGRESS OF 5-S ACTIVITIES POINTS TO BE OBSERVED" (Version Feb. 2012)
10. Muhimbili Hospital
  - "5S-CQI-TQM Progress Report 2009, 2011, 2012 Muhimbili hospital"
11. Tosamaganga Hospital
  - "Patient assessment sheet / patient questionnaire result"
  - "Progress report 2011"
  - "5S activity check list"
12. Mbeya Regional Hospital
  - "Progress report 2012"
  - "A study on factors influencing death among PLHIV admitted at MRRH in 2012"
  - "5S-KAIZEN-TQM Consultation Visit Interview sheet"
13. Mbeya Consultant Hospital
  - "5S Evaluation in 2010"
  - "Progress Report"
  - "Action plan"
  - "KAIZEN Progress Report 2010-2012"
14. Mbalizi Hospital
  - "Progress Report 2012"
  - "Action Plan 2013"
  - "Financial information"
15. Singida Hospital
  - "Report on 5S-KAIZEN Consultation Visit Singida Regional Hospital" (2012)
16. Mbeya Regional Health Management Team
  - Statistics about the medical status in Mbeya Region
17. Tanzanian German Programme to Support Health
  - "TGPSH Programme Progress Review 2008.11"
18. "National IPC Training of Trainers, Dodoma Tanzania 2010.08"

##### Senegal

1. "Strategie Nationale de Developement Economique et Social 2013-2017"
2. "Plan national de developpement sanitaire PNDS 2009 – 2018"
3. "Plan stratégique qualité 2011 – 2015 Ministere de la santé et de la prevention"
4. "Organigramme du ministere de la santé et de l'action sociale"
5. "Quality improvement stories" (FHI)
6. "CHANGE 2" in Benin
7. "Observations, des locaux du matériel technique et des supports" etc.
8. "PTA 2012 Region Medicale de Tambacounda"

9. "Guide de gestion du plan de travail annuel (PTA) supplement 2"
10. "SYNTHESE DES RESULTATS" (Programme National de Lutte contre les Infections Nosocomiales)
11. "Situation des personnels de sante du Senegal" (2010. 3)
12. "Enquête Démographique et de Santé à Indicateurs Multiples"
13. "Rapport de présentation du projet de budget 2012"
14. "5S implementation in health medical facilities" (PARSS: Projet d'Appui au Renforcement de Systeme de Sante au Senegal)
15. "Manuel Illustratif des 5S" (Draft)( PARSS)
16. "Guide Pratique des 5S a l'intention des formateurs" (Draft) (PARSS)
17. A presentation material of "Reinforcement of health system Phase 2" (JICA)
18. "Experimentation d'un modele de soins d'accouchement dans la Region de Tambacounda: Concept et modele des soins d'accouchement d'un point de vue des 5S-KAIZEN" (PRESSMN: Projet de renforcement des soins de santé maternelle et neonatale dans les regions de tambacounda et kedougou)
19. "Soins de santé maternelle et neonatale bases sur les preuves Manual de mise en oeuvre" (PRESSMN)
20. " Letter from Tamba" (PRESSMN)
21. "UNESCO Global Partnership for Girls' and Women's Education"
22. "Enseignement élémentaire ·Tableau recapitulative ·Taux Brut de Scolarisation"
23. "Rapport d'analyse situationnelle de l'offre de soins de santé maternelle dans 6 centres de santé de la région de Dakar" (2012)
24. Tambacounda Regional Hospital
  - "Plan de Travail", "Vision/Mission/Value" etc
  - "Fiche de suivi pour 5S"
25. Tambacounda Health Center
  - "TABLEAU DES EMPLOIS ET DES EFFECTIFS"
  - "PLANS D'ACTION DES UNITES/BLOCS DU CENTRE DE SANTE DE TAMBACOUNDA DANS LE CADRE DE LA MISE EN OEUVRE DES 5S, GESTION DES RESSOURCES HUMAINES ET MATERIELLES DANS LE CENTRE"
  - "Elaboration de plans d'actions"
  - "Principe et Pratiques des 5S dans le Centre de Santé"
  - "Relevé d'Activité"
26. Kothiary Health post
  - "Mise en pratique des activités de 5S et les soins humanisés dans le poste de santé de Kothiary" (2012)
  - "Canevas de Presentation du Bilan des Activites des Postes de Sante"
27. Gaspard Camara Health Center
  - "Etat des Recettes etc.
  - "Ministère de la Santé et de l'Action Sociale  
Région Médicale de Dakar District Sanitaire de Dakar Centre Centre de Santé Gaspard Kamara" (Feb. 2013)
28. Thies Hospital
  - "INTRODUCTION ET IMPLANTATION DE LA DÉMARCHE 5S AU CENTRE HOSPITALIER RÉGIONAL DE THIÈS"
  - "CHRT\_Banque de Sang\_Cartographie des Processus"
  - "PLAN D'ACTION"
29. Grand-Yoff hospital brochure

## Annex 5. PDMs of the technical cooperation projects in Senegal

ANNEX 5.  
Project Design Matrix (PDM) Version 1  
Project Title : Project for Reinforcement of Health System Management in Tambacounda and Kedougou

Date: February 7, 2012  
Duration : 3 years

Narrative Summary		Objectively Verifiable Indicators		Means of Verification		Important Assumptions	
<b>Overall Goal</b>							
The health status of the population of Tambacounda and Kedougou is improved		The MDG health-related indicators (including the reduction of child mortality, the improvement of maternal health, reduction of HIV/AIDS, malaria and other diseases) are improved in Tambacounda and Kedougou regions.		(1) Demographic Health Survey (EDS) (2) Unmet Obstetric Needs (BONC, Besoins obstétricaux non couverts) (3) National survey on Palu in Senegal (ENPS, Enquête Nationale sur le Paludisme au Sénégal)			
<b>Project Purpose</b>							
"Managing for results" (*1) capacity of the Medical Region and Health District Offices are reinforced in Tambacounda and Kedougou regions		The Medical Region Offices, Regional Services and Health Districts have each completed the following points, related to the management of the work for the fiscal year 2013 (from January to December 2013).  (1) The PTA for the fiscal year 2013 has been developed following the 8 steps outlined in the PTA Guideline. (2) The conduct of annual activities for the fiscal year 2013 has been monitored following the 7 steps outlined in the PTA Guideline. (3) The results for the fiscal year 2013 have been evaluated following the 3 steps outlined in the PTA Guideline. (4) The conduct of 5S-KAIZEN-TQM (*2) activities will be monitored at each Health Center according to standards and tools established before the end of 2013. (5) Activities to improve resource management (such as human resource, accounting/finance, medicines, medical equipment and facility management, etc.) will be planned and conducted at each Health District before the end of 2013 following the various guides and tools, including those provided by laws and regulations.		(1) PTA documents (Forms A, B and C) (2) PTA documents (Form D) (3) PTA document (Form E) (1)(2)(3) Reports of Medical Region Offices, Regional Services and Project Reports (4)(5) Reports of Health Districts and Project Reports		1. The Senegal side timely allocates the necessary resources (human, material and financial) to sustain and further develop the achievements of the Project. 2. The National Health Development Plan (PNDS) and the Mid-Term Health Sector Expenditure Framework (CDSMT) do not change. 3. The National Health Human Resource Development Plan is validated and implemented.	
<b>Outputs</b>							
1 The capacity of planning and monitoring & evaluation (M&E) of the Medical Region Offices and Health District Offices are improved		(1) At least one personnel in charge of health information processing in each Medical Region Office and each Health District Office receives training on information system by the end of year 2013. (2) A system to improve the planning, and monitoring-evaluation (team of trainers, training modules, implementation guide, training frameworks(*3), monitoring-evaluation mechanism and funding mechanism) will be established by the end of the year 2013. (3) During the year 2011, the initial version of the PTA Guideline was developed. (4) Before the end of 2013, the final version of the PTA Guideline will be developed. (5) Before the end of 2012, more than 80% of members of management teams of Medical Region Offices, Regional Services and Health Districts ("Equipes Cadres de Région (ECR)/District (ECD)") will attend the training on the PTA Guideline in the 2 regions. (6) Before the end of 2012, improved supervision tools will be put in place. (7) Before the end of 2012, over 80% of members of management teams of Medical Region Offices, Regional Services and Health Districts (ECR/ECD) will be trained in supervision.		(1)(2)(3)(4)(5)(6)(7) Project Reports (1)(2)(5)(7) Reports of Medical Region Offices (3)(4) PTA Guideline (6) Supervision tools		1. The Senegal side properly allocates the necessary budget and personnel for the project activities. 2. The Senegal side properly allocates budget for PTA implementation.	
2 The capacity to manage resources (organizational management such as human resource, accounting/finance, medicines and medical equipment and facility management, etc.) in the Medical Region Offices and Health District Offices are enhanced		(1) A system for improving resource management capacity (team of trainers, training modules, implementation guidelines, training frameworks(*3), monitoring-evaluation mechanism and funding mechanism) will be established by the end of the year 2013. (2) Before the end of 2012, an initial version of 5S-KAIZEN-TQM Practical Guide will be developed. (3) Before the end of 2012, training sessions in 5S-KAIZEN-TQM will be conducted in the 10 Health Centers. (4) Before the end of 2013, a final version of 5S-KAIZEN-TQM Practical Guide will be developed. (5) Before the end of 2013, the Guide on resource management will be developed. (6) Before the end of 2013, over 80% of management teams of Medical Region Offices and Health Districts (ECR/ECD) will attend training on the different guides/tools on resource management (such as human resource, accounting/finance, medicines, medical equipment and facility management, etc.).		(1)(2)(3)(6) Rapports de Projet (2)(4) Guide Pratique de 5S-KAIZEN-TQM (5) Guide sur le management de ressources (3)(6) Rapports des Régions Médicales			
3 Lessons learned from the Project are shared in both in and outside Tambacounda and Kedougou regions		(1) Before the end of the Project, the lessons learned from the implementation of systems to improve planning/monitoring-evaluation and resource management capacity will be validated, then shared with the other regions. (2) The guides/manuals related to the improvement of management capacity have been approved as national documents and shared with the other regions		(1) Joint evaluation Report (PV) of the Project and activity reports (2) Project Reports and Reports of other Medical Region Offices			
<b>Activities</b>		<b>Inputs</b>		<b>Senegal</b>			
1 The capacity of planning and monitoring & evaluation (M&E) of the Medical Region and Health District Offices are improved.		Japan				1. Trained counterparts are not posted elsewhere (to the extent of interrupting the Project activities)	
1-1. Streamline the management of the health information system (example checklists) in the Medical Region and Health District Offices		Experts (1) Chief Advisor, Management for results, Health sector planning (2) Financial management (3) 5S-KAIZEN-TQM (4) Monitoring and Evaluation (5) Health Information System (6) Other experts with necessary expertise.		Counterparts (1) Project Director (2) Project Managers (3) Ministry of Health and Social Action (4) Medical Region offices in Tambacounda and Kedougou. (5) Personnel of Health Districts (6) Other personnel mutually agreed upon as needed			
1-1-1. Verify the quality and utilization the National Health Information Service (SYSNIS) and/or other information systems in the Medical Region Offices and Health Districts by conducting a baseline assessment.							
1-1-2. Assist the Medical Region Offices in its analysis of health information and feedback to Health Districts, and to promote the use of data for the development of action plans.		Trainings (1) Training abroad (2) Training in Senegal (3) Other necessary trainings		Facilities, equipment and material (1) Office premises for the Project at the Ministry of Health and Social Action, Medical Region Medical Offices in Tambacounda and Kedougou (2) Equipment, materials and information necessary for the Project activities.			
1-1-3. Train the Health Districts in efficiently acquire, report and analyze health information on the basis of the baseline assessment results, under the guidance of the Medical Region Offices		Equipment and Materials The equipment and material necessary for the implementation of Project activities, such as printers, computers, copiers, mobile phones with digital cameras, projector for Kedougou office. * The equipment to be provided will be subject to change due to budget conditions of the Japanese side.		Payment for the Project counterparts			
1-2. Strengthen the operational management capacity of the Medical Region Offices and the Health Districts to execute Annual Work Plans (PTA)		Operating Costs		Local Costs (1) Operating Costs of the Project			
1-2-1. Conduct a joint baseline assessment on the actual situation and problems regarding planning and operational management							
1-2-2. Develop a monitoring and evaluation plan for Medical Region Offices to monitor and evaluate Health Districts' PTAs, with an emphasis on the topics of organizational management, resource management, progress management, etc.							
1-2-3. Strengthen operational management through training of the Medical Region Offices and Health Districts for PTA implementation based upon the results of the needs assessment.							
1-2-4. Strengthen PTA implementation in Medical Region Offices and Health Districts through M&E and regular supportive supervision from the national and regional levels as well as through coordination meetings.							
1-3. Assist Health Districts to develop realistic PTAs on the basis of the results of M&E.							
1-3-1. Identify priority areas of healthcare services in each Health District.							
1-3-2. Assist Health Districts to develop Local Collectivity Operational Plan POCL-Health and PTAs under the guidance of the Medical Region Offices.							
1-3-3. Develop an internal monitoring system for progress management of PTAs.							
1-3-4. Promote the use of the monitoring results for the planning of PTAs for the following year and other activities, through coordination meetings of the Medical Region Offices and Health Districts.							
2 The capacity to manage resources (organizational management such as human resource, accounting/finance, medicines and medical equipment and facility management, etc.) in the Medical Region Offices and Health District Offices are enhanced.							
2-1. Promote 5S activities in Health Districts.							
2-1-1. Conduct a baseline assessment on the working-environment and attitude of personnel in Health Districts.							
2-1-2. Train the personnel of Health Districts on 5S practice.							
2-1-3. Guide the Health Districts to formulate 5S action plans.							
2-1-4. Assist the Health Districts to implement 5S action plans.							
2-2. Strengthen Health District KAIZEN-TQM capacity.							
2-2-1. Evaluate Health District managerial capacity through the baseline assessment of organizational management such as human resource, accounting/finance, medicines and medical equipment and facility management.							
2-2-2. Develop a KAIZEN-TQM plan based on the priorities identified through the baseline assessment.							
2-2-3. Assist the Health Districts in the implement the KAIZEN-TQM plans.							
2-2-4. Guarantee the M&E of KAIZEN-TQM plans in each Health District.							
3 Lessons learned from the Project are shared in both in and outside of Tambacounda and Kedougou regions.							
3-1. Evaluate the intervention of the Project on the enhancement of capacity of health system management by conducting an end-line survey.							
3-2. Revise and update the documents (guidelines, manuals and other necessary materials) related to the lessons learned from the Project.							
3-3. Conduct public relations activities (presentation of project activities at central level, media publicity, publication of newsletters, etc.) to share information on project performance both in and outside of the target areas.						Pre-Conditions Counterpart organizations do not oppose the implementation of the Project	

\*1) "Management for Results" is one of the pillars of Senegal's National Health Development Plan. Managing for results means managing and implementing aid in a way that focuses on the desired results and uses information to improve decision-making (The Paris Declaration, 2005)  
\*2) The "5S-KAIZEN-TQM" approach is a tool to improve the working environment as well as the quality and the productivity of services.  
\*3) CRFS is an Academic Institution

**ANNEX 5-2. Project Design Matrix (PDM)**

Version: 0

**Project Title: Projet de Renforcement des Soins de Santé Maternelle et Néonatale au Sénégal (PRESSMN) Phase II**

Duration: 4 years from November 2012 to October 2016

Target Area: Whole country of Senegal

Implementing Agency: Ministère de la Santé et de l'Action Sociale (Le Cabinet, Direction Generale de la Santé esp. Direction chargée de santé de la mère et de l'enfant, Direction des Ressources Humaines et École Nationale de Développement Sanitaire et Social (ENDSS))

Beneficiaries: Pregnant women and newborns in Senegal

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal</b> MMR and NMR are reduced through improvement of services for maternal and neonatal health in Senegal.</p>	<p>Following indicators mentioned in the Sectoral Mid-term Expenditure Framework (Cadre de Dépenses Sectoriel à Moyen Terme: CDSMT) 2011-13 (1) Maternal mortality rate (2) Neonatal mortality rate (3) Rate of utilisation of antenatal care (consultation prénatale: CPN) (4) Proportion of delivery in the health facilities (5) Proportion of delivery by skilled birth attendants (6) Rate of postnatal care (consultation post natales: CPoN)</p>	<p>Demographic Health Survey (enquête démographique et de santé à indicateurs multiples: EDS-MICS)</p>	
<p><b>Project Purpose</b> The scaling-up of PRESSMN model is realized nationwide.</p>	<p>(1) 7 out of 10 District Health Offices (District Sanitaires) implement PRESSMN model in the Regions of Tambacounda and Kédougou. (2) 22 out of 66 District Sanitaires implement PRESSMN model in 12 Regions except Tambacounda and Kédougou. (3) Number of delivery in the health facilities applying PRESSMN model increases by 20% in average. (4) Number of women completing the fourth ANC increases by 20% in average in the health facilities applying PRESSMN model.</p>	<p>(1) Project reports (2) Project reports (3) Annual Statistics of the National Service for Health Information (Service National de l'Information Sanitaire: SNIS) (4) Project reports</p>	
<p><b>Outputs</b> 1. Structure for national coordination of PRESSMN model is established and operational in the Ministry of Health and Social Action (Ministère de la Santé et de l'Action Sociale: MSAS).</p>	<p>1(1) PRESSMN model validated by the Scale-up Committee (Comité de passage à l'échelle) 1(2) PRESSMN model is integrated into the Annual Working Plan (Plan de Travail Annuel: PTA) of the Direction in charge of maternal and child health, as well as into policy documents (PNP, Strategic Plan of Reproductive Health, etc) 1(3) Strategy for dissemination and extension of PRESSMN model is defined.</p>	<p>Project reports</p>	
<p>2. Structure for regional coordination of PRESSMN model is established and operational in 14 Regional Medical Offices (Région Médicales: RM).</p>	<p>2(1) Number of Régions Médicales that incorporate PRESSMN model into their Annual Working Plan (Plan de Travail Annuel: PTA) 2(2) Number of Régions Médicales that adopted strategy of dissemination and extension of PRESSMN model 2(3) Number of RM that selected "Pilot Units" 2(4) Number of RM that trained "Pilot Units"</p>	<p>Project reports</p>	
<p>3. PRESSMN model is integrated into the curricula of Registered Nurses (Infirmiers Diplôme d'État: IDE) and Registered Midwives (Sage-femmes d'État: SFE).</p>	<p>3. Validated curricula of IDE and SFE with incorporation of PRESSMN model</p>	<p>Curricula of ENDSS</p>	
<p>4. The effects of PRESSMN model are assessed by research studies.</p>	<p>4(1) Number of research studies conducted 4(2) Number of key findings of effectiveness of PRESSMN model in website of MSAS 4(3) Number of the results of the research disseminated in academic conferences 4(4) Number of the results of the research published in journals</p>	<p>(1) Research studies reports (2) Website of MSAS (3) Presentation of the results disseminated in academic conferences (4) Papers published in journals</p>	
<p><b>Activities</b> 1-1 Ministry of Health and Social Action (Ministère de la Santé et de l'Action Sociale: MSAS) conducts baseline, intermediate and endline survey to collect the data such as the number of delivery cases in the health facilities to monitor and evaluate the Project. 1-2 MSAS holds "the Expanded Working Group" meeting. 1-3 MSAS develops and validates the strategy for national dissemination and extension of PRESSMN model, including TOT program and the mechanism of monitoring and evaluation, with collaboration of Comité de passage à l'échelle. 1-4 MSAS elaborates tools and materials to advocate the strategy for national dissemination and extension of PRESSMN model to stakeholders such as relevant directions of MSAS, Regional Medical Offices (Région Médicales: RM), development partners, universities and relevant associations. 1-5 MSAS conducts workshop to advocate the strategy for national dissemination and extension of PRESSMN model to RM. 1-6 MSAS conducts TOT for regional level by central level. 1-7 MSAS supervises RM on the implementation of PRESSMN model and facilitates peer vision between RMs.  2-1 RMs hold workshops to sensitise the PRESSMN model to administratifs régionaux, collectivités locales, comités de santé, Non Governmental Organisations (Organisations non gouvernementales: ONG) and private sectors. 2-2 RMs conduct TOT for "Pilot Units". 2-3 RMs supervise "Pilot Units" to implement PRESSMN model through their routine supervision. 2-4 RMs hold meetings to develop the plan for regional dissemination and extension of PRESSMN model.  3-1 MSAS and ENDSS holds workshops to mobilise the stakeholders of curriculum development to review and modify the curricula of Registered Nurses (Infirmiers Diplôme d'État: IDE) and Registered Midwives (Sage-femmes d'État: SFE). 3-2 MSAS and ENDSS modify the curricula of IDE and SFE.  4-1 MSAS develops a research protocole. 4-2 MSAS implements the research. 4-3 MSAS diffuses the results from the research.</p>	<p style="text-align: center;"><b>Inputs</b></p> <p><b>Japan side</b> 1. Long-term experts: 3 2. Short-term experts: as necessary 3. Training in Japan and third countries 4. Participation in international conferences and workshops 5. Machinery and equipment</p> <p><b>Senegal side</b> 1. Project Director: Directeur General of Health 2. Project Manager: Direction in charge of maternal and neonatal health 3. Health workers involving in maternal and neonatal health 4. Suitable office space 5. Budget arrangement</p>	<p style="text-align: center;"><b>Preconditions</b></p>	

## Annex 6. List of the indicators in the “5S-KAIZEN-TQM Approach” in the health sector

Problem	Cause	Sample indicator for output	Sample indicator for direct outcome	Sample indicator for intermediate outcome	Sample indicator for impact	Sample indicator for the super goal
Medical accidents (Safety)	Errors in patient information	<ul style="list-style-type: none"> <li>Sorted files and medical records (S1)</li> <li>Medical records stored according to rule (S2)</li> <li>Patient information posted near the patient (S2)</li> <li>Established rules on sharing patient information (S4)</li> <li>Work performed according to rule (S5)</li> </ul>	<ul style="list-style-type: none"> <li>Number of mistaken retrievals of patient information</li> <li>Number of lost information on patients</li> <li>Average time required to confirm patient information</li> <li>Number of claims from patients</li> <li>Degree of understanding of staff on handling rules</li> </ul>	Project purpose “Continuous reduction of medical accidents”	<b>Impact</b> <b>“Improvement of hospital management”</b> ☆ Degree of improvement in survey on patient satisfaction (hospital facilities/ medical treatment) ☆ Occupancy rate of hospital beds (per year) (Number of inpatients/ total number of beds) ● Number of patients referred from other hospitals (per year) ● Number of medical treatments (per year) (operations, checkups, deliveries)	
	Errors in drugs/ medical device handling	<ul style="list-style-type: none"> <li>Discard of unnecessary drugs/ medical equipment (S1)</li> <li>Labeled drugs/ medical equipment (S2)</li> <li>Drugs/ medical equipment stored at designated places (S2)</li> <li>Established rules to discard/ store/ handle drugs/ medical equipment (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Number of disposal of unnecessary drugs/ equipment</li> <li>Number of mistaken retrievals of drugs/ medical equipment</li> <li>Average time required to retrieve drugs/ medical equipment</li> <li>Degree of understanding of staff on handling rules</li> </ul>			
	Deficiency in work environment	<ul style="list-style-type: none"> <li>Discard of unnecessary items in hospital (S1)</li> <li>Safety pathways ensured and directions posted (S2)</li> <li>Regular cleaning in hospital (S3)</li> <li>Predetermined frequency, content, and assignment of hospital cleaning (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Number of close calls</li> <li>Number of patients falling/ hurting</li> <li>Number of claims from patients</li> <li>Frequency of cleaning hospital</li> </ul>			
	Deficiency in equipment maintenance	<ul style="list-style-type: none"> <li>Regular cleaning/ maintenance of equipment (S3)</li> <li>Established rules to inspect equipment (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Frequency of cleaning/ inspection of devices</li> <li>Number of detected defects in equipment</li> </ul>			
Hospital infection (safety)	Lack of enlightenment for patients/ staff	<ul style="list-style-type: none"> <li>Signs and posters to raise awareness posted at places where needed (S4)</li> <li>Established criteria for cleaning assignment (S4)</li> <li>Shine assignment and criteria posted (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Degree of recognition of rules among patients/ staff</li> <li>Degree of understanding of hospital infection among staff</li> </ul>	Project purpose “Continuous reduction of hospital infection”	<b>Impact</b> <b>“Improvement of hospital management”</b> ☆ Survey on patient satisfaction (hospital facilities/ medical treatment/ cleanliness) ☆ Occupancy rate of hospital beds (%) (Number of inpatients/ total number of beds*100) ● Number of medical treatments (per year) (operations, checkups, deliveries) ● Number of patients referred from other hospitals (per year)	
	Deficiency in measures against infection	<ul style="list-style-type: none"> <li>Established rule for hand disinfection (S4)</li> <li>Work according to disinfection rules (S4)</li> <li>Established rule for equipment disinfection (S4)</li> <li>Work according to disinfection rules (S4)</li> <li>Established rule for using gloves/ masks (S4)</li> <li>Work according to rule for usage (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Degree of recognition of rules among patients/ staff</li> </ul>			
	Deficiency in work environment	<ul style="list-style-type: none"> <li>Sort unnecessary items in hospital (S1)</li> <li>Regular cleaning in hospital (S3)</li> <li>Predetermined frequency, content, and assignment of hospital shine (S4)</li> <li>Regular disinfection in hospital (S3)</li> <li>Predetermined frequency, content, and assignment of hospital disinfection (S4)</li> <li>Unused equipment stored at designated places (S2)</li> <li>Established rule to store unused equipment (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Frequency of hospital cleaning</li> <li>Frequency of hospital disinfection</li> <li>Number of units of unused equipment</li> </ul>			
	Deficiency in waste disposal	<ul style="list-style-type: none"> <li>Established rule to clean contamination (S4)</li> <li>Waste sorted, and discarded at designated places; established rules for waste disposal (S4)</li> <li>Waste separated from general garbage before discard (S3,S4)</li> </ul>	<ul style="list-style-type: none"> <li>Number of trash cans for sorting</li> <li>Degree of understanding of contact network to be used in case of infection</li> </ul>			
Improving management of pharmaceuticals/ equipments (lack of goods / money)	Dead inventory	<ul style="list-style-type: none"> <li>Discard of expired inventory (S1)</li> <li>Regular inventory clearance (S4)</li> <li>Storage where older items are placed in the front (S2)</li> </ul>	<ul style="list-style-type: none"> <li>Amount of expired inventory discarded</li> <li>Frequency of inventory clearance</li> <li>Time required to procure items</li> </ul>	Project purpose “Utilize cost of drugs/ equipment: amount to purchase new drugs/ equipment” ☆ Amount of inventory (\$/year) ☆ Cost of medical materials (\$/year)	<b>Impact</b> <b>“Improvement of hospital management”</b> ● Expense rate (%) (Expense/medical profit*100) ● Rate of medical material cost (%) (medical material cost/ medical profit*100) ● Amount of medical profit (\$) ● Survey on patient satisfaction regarding supply of drugs and medical devices	Super goal “Continuous provision of public medical service” <Indicators> ☆ Change in comprehensive survey on patient satisfaction on provided medical service
	Deficiency in inventory management	<ul style="list-style-type: none"> <li>Prepared, and utilized ledger (S4)</li> <li>Labeled drugs/ equipment (S2)</li> <li>Drugs/ equipment stored at designated places (S2)</li> </ul>	<ul style="list-style-type: none"> <li>Amount of expired inventory discarded</li> <li>Number of unlabeled drugs/ equipment</li> <li>Number of drugs/ equipment not stored at designated places</li> <li>Time required to procure items</li> </ul>			
	Deficiency in management of order	<ul style="list-style-type: none"> <li>Established rule for ordering (S4)</li> <li>Work according to rule for ordering (S4)</li> <li>Established rule for ordering (cleanliness)</li> <li>Rule for ordering observed by staff (cleanliness)</li> <li>Labels to show timing of order (S2)</li> <li>Storage place that cannot store inventory more than necessary (S2)</li> </ul>	<ul style="list-style-type: none"> <li>Amount of expired inventory discarded</li> <li>Number of days where drugs are out of stock</li> <li>Number of days where medical devices are out of stock</li> <li>Amount of expenses (\$/year)</li> <li>Cost of medical materials (\$/year)</li> </ul>			
Improving “job” efficiency (lack of labor/ money)	Deficiency in providing guidance for patients	<ul style="list-style-type: none"> <li>Hospital information maps posted (S2)</li> <li>Signs for patient induction posted (S2)</li> <li>Ingenuity such as wall color changed by the department (S2)</li> </ul>	<ul style="list-style-type: none"> <li>Number of inquiries on guidance from patients</li> <li>Number of patients given guidance</li> <li>Number of improvements in hospital signs</li> </ul>	Project purpose “Continuous reduction of patient waiting hours”	<b>Impact</b> <b>“Improvement of hospital management”</b> ● Number of staff per patient (Number of staff/ number of patients) ● Profit per inpatient (\$/head) (Profit from inpatients/ number of inpatients) ● Profit per outpatient (\$/head) (Profit from outpatients/ number of outpatients) ● Medical profit per bed (\$/bed) (Profit/number of beds) ● State of labor cost (%) (Total salaries/medical profit) ● Profit per employee (\$/head) (medical profit/ number of staff) ☆ Patient satisfaction (provision of hospital information) ☆ Patient satisfaction (period of hospital stay) ☆ Staff satisfaction (work environment)	
	Deficiency in managing documentation	<ul style="list-style-type: none"> <li>Disposal of unnecessary documents (S1)</li> <li>Labeled documents (S2)</li> <li>Documents stored at designated place according to the content (S2)</li> <li>Documents stored at designated place (S4)</li> </ul>	<ul style="list-style-type: none"> <li>Number of missing documents</li> <li>Time required to retrieve documents</li> </ul>			
	Deficiency in managing equipment	<ul style="list-style-type: none"> <li>Discard of unnecessary equipment (stationary) (or use for other purposes) (S1)</li> <li>Equipment stored at designated place with labels (S2)</li> <li>Signs indicating places to store equipment (S2)</li> <li>Labeled power switches and other equipment (S2)</li> </ul>	<ul style="list-style-type: none"> <li>Number of unnecessary devices used for other purposes</li> <li>Number of missing devices</li> <li>Time required to retrieve devices</li> </ul>			
	Lack of organizational capacity	<ul style="list-style-type: none"> <li>Regular training for all staff (S5)</li> <li>5S implemented by small groups (S5)</li> </ul>	<ul style="list-style-type: none"> <li>Frequency of training</li> <li>Total number of staff/ divisions participating in training</li> <li>Scores of proficiency test after training</li> <li>Number of staff/ divisions participating in small group activity</li> <li>Number of reports on implemented small group activity</li> <li>Frequency of briefing sessions on small group activity</li> </ul>			
Improving “job” quality	Deficiency in operation standard	<ul style="list-style-type: none"> <li>Review of present work (workflow) (K)</li> <li>Prepared operation standard (workflow) (K)</li> </ul>	<ul style="list-style-type: none"> <li>Number of revisions in operation standard</li> <li>Number of briefings to review operation standard</li> <li>Number of issues of operation standard prepared</li> <li>Number of divisions that have prepared operation standard</li> </ul>	Project purpose Standardization of service quality ● Number of malpractices/ medical negligence/ accidents (per year) ● Number of hospital infections (per year)	<b>Impact</b> <b>“Improvement of hospital management”</b> ☆ Occupancy rate of hospital beds (%) ● Number of patients referred from other hospitals (per year) ☆ Number of medical treatments (per year) ☆ Patient satisfaction (medical treatment) ☆ Staff satisfaction (work efficiency)	☆: Indicators that are already utilized in the existing JICA projects, or utilized in health and medical facilities
	Deficiency in familiarization of operation standard	<ul style="list-style-type: none"> <li>Operation standard understood by staff (K)</li> <li>Operation standard posted (K)</li> <li>Compliance with operation standard confirmed (K)</li> </ul>	<ul style="list-style-type: none"> <li>Number of divisions posting operation standard</li> <li>Number of patrols/ confirmations by QIT etc</li> <li>Number of briefings by divisions using operation standard</li> </ul>			
	Deficiency in improving operation standard	<ul style="list-style-type: none"> <li>Analysis of reason for non-compliance with operation standard (K)</li> <li>Preparing/ sharing a collection of close calls (K)</li> <li>Comparing/ analyzing causes of close calls with operation standard (K)</li> </ul>	<ul style="list-style-type: none"> <li>Preparation of a collection of cases by QIT</li> <li>Number of divisions where a collection of cases is distributed</li> <li>Number of briefings by divisions using operation standard</li> <li>Number of convened workshops to study cases in hospital standard (K)</li> </ul>			
Improving organizational capacity	Lack of information	<ul style="list-style-type: none"> <li>Regular training for all staff (S5)</li> <li>Posted slogans and posters (S2)</li> <li>Initial training to introduce KAIZEN (S5)</li> </ul>	<ul style="list-style-type: none"> <li>Number of trainings</li> <li>Number of staff/ divisions participating in training</li> <li>Score of proficiency test after training</li> <li>Test to check level of recognition on organization goal</li> <li>Score of 5S/ KAIZEN proficiency test</li> </ul>	Project purposes Improved work efficiency ● Average hours of overwork (hour/head) ● Labor cost (\$/year)	<b>Impact</b> <b>“Improvement of hospital management”</b> ● Number of staff per patient (Number of staff/ number of patients) ● Profit per employee (\$/head) (medical profit/ number of staff) ☆ Patient satisfaction (Staff service) ☆ Staff satisfaction (morale, work efficiency)	
	Lack of experience	<ul style="list-style-type: none"> <li>5S activity by small groups (S5)</li> <li>Training to find problems at work (S5)</li> <li>Presentation of activities by small groups (S5)</li> </ul>	<ul style="list-style-type: none"> <li>Number of staff/ divisions participating in small group activity</li> <li>Number of reports on implemented small group activities</li> <li>Number of presentations on small group activities</li> <li>Number of staff/ divisions participating in training</li> </ul>			
	Deficiency in system	<ul style="list-style-type: none"> <li>Set a high goal, plan, and implement (Plan, Do)</li> <li>QIT confirms the result of WIT activities by checklist (Check)</li> </ul>	<ul style="list-style-type: none"> <li>Number of plans</li> <li>Number of planning divisions</li> <li>Number of convened regular meetings</li> <li>Number of checks by QIT</li> </ul>			
		<ul style="list-style-type: none"> <li>Confirm the result using indicators, and challenge higher goals (Action)</li> <li>Post workflow (S5)</li> <li>Post result of activities (S5)</li> <li>Award result of activities (S5)</li> </ul>	<ul style="list-style-type: none"> <li>Number of monitors by senior staff</li> <li>Number of convened regular meetings</li> <li>Number of divisions posting workflow</li> <li>Number of divisions posting result</li> <li>Number of achieved goals</li> <li>Number of presentations on results</li> <li>Number of divisions presenting results</li> <li>Number of awards for results</li> <li>Number of divisions to be awarded</li> </ul>			

## Annex 7. List of the surveyed hospitals (Tanzania & Senegal)

	Mhinbili National Hospital	Tosamaganga Hospital	Mbeya Consultant Hospital	Mbeya Regional Hospital	Mbalizi Hospital
Competent authority	MOHSW	Roman Catholic Church	MOHSW	Mbeya Region	Faith-based
Number of beds	1500	184	477	80	150
Number of staffs	2700	200	860	198	108 (including 18doctors, 20nurses)
Number of inpatients	1000-1200	87	85	98-120	150-200
Number of outpatients	1000-1200	150	360	250-300, CTC 150 (Care Treatment Center HIV-AIDS)	180
Location	Dar es salaam	Iringa	Mbeya	Mbeya	Mbeya
Remarks	One of the most representative hospital in the country	Faith-based, starting 5S by their own	Implementing 5S-KAIZEN most successfully	-	Starting 5S since July, 2012
Human resource by hospital	4 QIT members (Nurses) Number of trainee in 5S training: 48 (2012) Number of trainee in KAIZEN: 72 (2012)	18 QIT staffs (Doctors, nurses, Admin, accountants, etc.) 89 staffs joined in the 5S orientation (Y2011) 30 staffs joined in the 5S-CQI-TQM training (Y2011) 28 staffs joined in the KAIZEN training (Y2011) 23 staffed joined in the training in Mbeya Consultant hospital	10 QIT members (including 3 doctors and 5 nurses) 120 staffs joined in the KAIZEN training (Y2010~Y2012)	14 QIT members (3 doctors, 5 nurses etc.)	①5S training to staffs given by the hospital ②QIT team
material resource by hospital	①QIT office ②Items put on billboards ③Wastes to re-use for vial containers	Recycled wastes to make packages for vials	①QIT office ②Original materials for training ③Trainings to staff members	Recycled wastes	①Shelves ②Recycled wastes ③Posters
Financial resource by hospital	Budget for quality improvement 5 million shilling per year	20% of hospital expenditure are for 5S activities since Y2012.	Mid-term expenditure contains 5S costs	Budget for 5S in 8 million shilling/Y	Transportation for outside training and lunch, or cost for purchase of necessary items were expensed from the hospital budget
Human resource from outside (Ministry, donors etc.)	Circuit training by experts	Invitation of consultants from Mbeya Consultant hospital Training in Mbeya Consultant hospital	Patrol by Japanese experts and JOCV	A GIZ staff in QIT team	Trainers
Material resource from outside (Ministry, donors etc.)	"Implementation Guideline for 5S-CQI-TQM Approaches in Tanzania"	"Implementation Guideline for 5S-CQI-TQM Approaches in Tanzania"	"Implementation Guideline for 5S-CQI-TQM Approaches in Tanzania"	"Implementation Guideline for 5S-CQI-TQM Approaches in Tanzania"	Training materials, Camera, 20 T-shirts with QIT logo, Caps
Financial resource from outside (Ministry, donors etc.)	General annual budget	Basket fund of MOH	Basket fund of MOH	IPC (Basket funds from MOH) QUMIC approaches by the support of GIZ	Budget given from the church
Program by other donors	IPC (Infection Prevention Control)	IPC	①IPC ②ACREDITATION by ABOIT	①IPC ②QUMIC approach	CUMIC by GIZ before starting 5S
Main challenges in hospital	Unclean atmosphere in the hospital	Unclean atmosphere in the hospital	①The recognition to "quality" was not shared among the staffs. ②Shortage of medicine, human resources etc., which affected the appropriate treatment to patients. ③Lack of confidence among staffs, caused by lost of items	Lack of human resource in storage department	Patients' complaints against the long staying time in the hospital
How to utilize 5S for the challenges	-	5S was used for just cleaning the facility, but this brought the sense of the responsibility to maintain the atmosphere for everyone.	-	To reduce over-time work or working in holidays	To reduce the waiting time in the reception or the account by ordering charts
Trigger in starting 5S	①Motivated management staffs ②Self analysis by comparison to other hospitals	Participation in a 5S workshop in Dar es salaam	①Participation in AAKCP program in Tokyo (Director) (Y2007) ②More confidence to QIT after the success in pilot depts. ③Giving training on 5S purposes and its contents before implementation	3 staffs joined in the 5-days-training of 5S in Mbeya Consultant hospital.	A sister came to know 5S in a CACCC meeting.
Start 5S since	Y2007	October, 2010	August, 2007	Y2010	July, 2012
Internal obstacles in starting and implementing 5S	①Resistance from doctors ②Reluctance to changing working manners ③Tendency of "cleaning is not my duty"	①Resistance from staffs ②Stagnation of 5S implementation by lack of understanding ③Time for training and TOT in working hours	①Resistance from doctors and staffs in starting 5S because of doubt on its outcomes ②Misunderstand 5S philosophy as a general cleaning activity ③Standardization ④Increase number of staffs those who understand 5S well	1. Lack of financial resource 2. Combination of 5S and existing QMIC (Quality management improvement Circle) program	1)Staffs' stronger commitment against 5S activity 2)Leadership of QIT-Chairperson 3)Taking time for the sorting because of planning the lay-out after the sorting 4)Insufficient space for sorting 5)Some staffs resist to 5S without enough understanding
External obstacles in starting and implementing 5S	Job rotation	No Swahili materials (Only English materials)	Job rotation of staffs	Lack of financial resource	1)Lack of water, electric power 2)Many traffic accidents by the roadside 3)Smaller salary which makes the staffs shift to other hospitals
Starting KAIZEN since	-	-	Y2010	-	-
Contents of KAIZEN activity	-	-	①Starting KAIZEN 3 year after 5S ②3 themes 1) Preventing staffs' embezzlement by false receipt 2) Decrease over-stock 3) Decrease waiting time of patients ③530 staffs already joined in the KAIZEN training	-	-
Obstacles in starting and implementing KAIZEN	-	-	Difficulty in implementation in more than one department	-	-
Volume of introductive training of 5S	-	1) Training by a consultant invited from Mbeya in May, 2011 2) 2-days-training in Mbeya	①AAKCP program ②3 staffs joined in the training in Sri Lanka ③Internal training since Y2007-2008/1Q	1) 3 staffs joined in the training in Mbeya Consultant hospital 2) These 3 staffs trained 30 staffs in internal trainings	①3 staffs joined in a training in Iringa ②16 staffs joined in the training in Mbeya Consultant hospital ③30 heads of Department, 20 QIT staffs, 76 WIT joined in the JICA training ④Participation in Progress Report Meeting ⑤3 staffs joined in the training in KCMC or Mbeya Consultant hospital in September, 2012
Pilot department of 5S trial	Select a warehouse as a showcase	Maternity, Patient record, Accounting and Laboratory	Surgical, OPD, Pediatric, Patient record, Admin, Central store	Central store, Patient record, OPD, Dispensing, Wards, Maternity, Laboratory, X-ray	Starting from Medical record, and expanded to OPD reception
How to select the pilot dept.	Departments who were motivated by the participation in the training held by Japanese experts	4 departments understood the purpose and contents of 5S. They were chosen with a consultant from Mbeya.	1) Departments who were eager to start 5S and who were NOT eager to do so 2) Clinical dept. and admin dept.	Departments who were not kept in order, such as warehouse, accounting, medicine, and charts.	Medical record dept. faced the problems such as loss of files and taking much time to reach a record.
Role of Director in 5S activity	Persuasion and coaching to those who were reluctant to 5S	Support and follow up QIT's and WIT's activities	1) Introduction 5S outcomes by showing cases of Sri Lanka or of own hospital in MOH 2) Getting MOH's approval of starting 5S and report its progress to them 3) Appealing the necessity of quality improvement to managers in the hospital	Support on working equipment, supervision Antceptics, dustbins provides	Follow-up of 5S activities, budget, monthly QIT meeting
Role of QIT in 5S activity	①Evaluation of 5S twice a year ②Competition and rewarding	1) 5S progress meeting in every Friday 2) Annual rewarding 3) Quarterly 2-days training to all the staffs	1) Persuasion to those who resist to 5S 2) Regular meeting in every Friday	①Consultation by Mbeya Consultant Hospital ②Self-assessment in October, 2010	Regular meeting
Recent challenges	Increase of patients	Taking time for training to new staffs	Difficulty in "Large KAIZEN" which is implemented in more than one department	Lack of resources	Training to new staffs
Short-term output (below 1 year)	①Create new physical space ②Shorten the time for searching for documents ③More efficient guiding for patients by the visualization of information ④Clean facility	①Timely and adequate treatment without wasting time of searching for necessary instruments ②It takes 3~5 minutes to take out a patient record. It took over 20 minutes previously. ③3 staffs were reduced to 2 in the reception. ④Patients waiting time was reduced from 3 hours to 1 hour. ⑤Effective layout of instruments	①Plenty of useful items were found in the central store. ②Change of working process in the accounting to prevent the embezzlement. ③The stocked items have been reduced to below 50% ④OPD changed the working process in passing information to the laboratory more frequently. It has shortened patients waiting time.	①Store department started time-management such as "first-in, first-out", or improvement in purchase of items. ②Packages made by recycled wastes ③Shorten patients' waiting time ④Clean facility ⑤Reduction of wastes in goods or in activities ⑥Dangerous wastes are separated by color-coded dust-boxes. ⑦Goods are put in order visually	①Instruments are put in order. ②Creation of new space ③A patient record can be found in a few minutes. ④Staffs' safety by separating dangerous goods or wastes ⑤Visual signboards and maps
Long-term outcome (over 1 year)	①Staffs came to be creative ②Improvement of Teamwork ③Every department uses common tools of 5S.	①Staffs' mind has changed to be positive ②Revenue increased from 21 million to 28 million shilling in 3 months by changing the work process. Provision of medicine after the payment has prevented patients' return without payment.	①Staffs' better attitude to work ②More efficient use of medicines and instruments ③Better management of internal resources ④Better relationship among departments ⑤Taking cost into their consideration ⑥Better communication about the improvement of working environment ⑦Patient satisfaction brought by the staff satisfaction.	①Improvement of service quality ②Patient satisfaction	Sensitization against the improvement of working environment
Indicators for hospital evaluation	Check points mentioned in TQIF	Questionnaire to patients	Questionnaire to patients Staff evaluation including the dedication to 5S activity	QMIC tool and 5S checklist	-
Indicators for 5S evaluation	5S check list	5S check list	5S check list	5S check list	5S check list



	Tambacounda Regional Hospital	Tambacounda Health Center	Kotary Health Post	Thies Hospital	Gaspard Camara Health Center	Grand-Yoff Hospital
Competent authority	MOH	Regional Medical Office	Regional Medical Office	MOH	Regional Medical Office	MOH
Number of beds	115	24	-	324	24	237
Number of staffs	163 (Including 10 doctors)	70 (Including 5 doctors and 6 nurses)	7 (Including 3 nurses, no doctors)	210	98 (Including 5 doctors and 21 nurses)	693
Number of inpatients	-	-	-	-	20	-
Number of outpatients	100	-	30 per day	-	-	-
Location	Tambacounda city, 400km from Dakar	Tambacounda city	Outskirt of Tambacounda city	Thies Region, 40km from Dakar	Dakar	Dakar
Human resource by hospital	<ul style="list-style-type: none"> <li>Participation in 5S training by ex. director</li> <li>Establishment of QIT,WIT</li> </ul>	<ul style="list-style-type: none"> <li>Advices from Health Education Director (Rewarded in the first 5S competition)</li> <li>Establishment of 5S sub-committee</li> <li>Establishment of QIT</li> </ul>	<ul style="list-style-type: none"> <li>Involvement by the chief</li> </ul>	<ul style="list-style-type: none"> <li>5S committee</li> <li>5S team (QIT)</li> </ul>	<ul style="list-style-type: none"> <li>Participation in trainings and inspections by the chief</li> <li>Participation in the health committee with local residents</li> <li>Establishment of QIT,WIT</li> </ul>	<ul style="list-style-type: none"> <li>The Director who has experience in the 5S introduction in Thies hospital</li> <li>10 members in the Quality Cell</li> <li>14 members in the Quality Committee</li> </ul>
material resource by hospital	<ul style="list-style-type: none"> <li>Action plan</li> <li>signboards</li> </ul>	-	-	<ul style="list-style-type: none"> <li>Digital camera</li> <li>Jackets for QIT members with logo</li> <li>Incinerator</li> <li>Furniture for putting items</li> </ul>	<ul style="list-style-type: none"> <li>Papers, pens, and other materials purchased by the approved budget in the health committee</li> </ul>	-
Financial resource by hospital	Outsourcing fee for the facility cleaning	-	Profit gained by the medicine sales	5S expense from the general budget	Budget approved by the health committee	Hospital general budget
Human resource from outside (Ministry, donors etc.)	<ul style="list-style-type: none"> <li>Supervisions by JICA experts and MOH</li> <li>French hospital reform "Change2" program <ul style="list-style-type: none"> <li>Training to staffs</li> <li>Problem analysis</li> <li>Experience of success</li> </ul> </li> <li>JOCV (a nurse)</li> <li>Outsourcing contract in facility cleaning</li> <li>Training in Japan and in Sri Lanka</li> </ul>	<ul style="list-style-type: none"> <li>Training by PARSS</li> <li>Supervision by MOH</li> <li>Rewarding system by PARSS</li> </ul>	<ul style="list-style-type: none"> <li>Participation in a training in Japan by the chief</li> <li>JOCV (a nurse)</li> <li>Experts in PRESSMN project</li> <li>Local residents joining in weekly regular cleaning</li> </ul>	<ul style="list-style-type: none"> <li>Training by JICA</li> <li>JOCV (a nurse)</li> <li>Supervision by MOH</li> </ul>	<ul style="list-style-type: none"> <li>Experts from PARSS</li> <li>The health committee with the involvement of local residents</li> </ul>	<ul style="list-style-type: none"> <li>Change 2 program by French government</li> <li>Training by JICA</li> </ul>
Material resource from outside (Ministry, donors etc.)	-	<ul style="list-style-type: none"> <li>Constructions of new buildings by a French NGO</li> <li>Donation of an ambulance by Spanish NGO and by UNFPA</li> </ul>	<ul style="list-style-type: none"> <li>A manual issued by PRESSMN</li> <li>Chairs, mattress, cushion, partitions in a maternity ward donated by JICA</li> </ul>	None	None	Boxes or labels donated by JICA
Financial resource from outside (Ministry, donors etc.)	<ul style="list-style-type: none"> <li>Financial support from JICA</li> <li>Support from the regional office</li> </ul>	Support from the region (7.5 million franc/Y)	<ul style="list-style-type: none"> <li>Salary to the chief provided from the regional office</li> <li>Budget from the health committee (700-800 thousand franc/Y) to be used for the staff salary and purchase of medicine</li> </ul>	<ul style="list-style-type: none"> <li>10 million franc support by JICA</li> <li>320million franc for equipment installation by JICA</li> <li>Support by the World Bank for equipment</li> </ul>	Support by FHI(Family Health International)	None
Program by other donors	None	AIDS program by MOH/FHI	None	None	HIV program by FHI	Change 2
Main challenges in hospital	<ul style="list-style-type: none"> <li>Lack of doctors and nurses</li> <li>Severe financial situation</li> </ul>	<ul style="list-style-type: none"> <li>No waiting room for patients</li> <li>Small maternity ward</li> <li>Delay of the payment claim to patients</li> <li>Lack of staffs</li> <li>Unclean facility</li> <li>Improvement of income and expenditure</li> </ul>	<ul style="list-style-type: none"> <li>Full of works</li> <li>Insufficient treatment to pregnant</li> <li>Disordered working space</li> <li>Insufficient communication among staffs</li> </ul>	Risk management against errors	<ul style="list-style-type: none"> <li>Piled up items</li> <li>No space</li> <li>Staffs were too busy to put things in order.</li> <li>Taking time to respond to other staff's inquiry, or no response</li> </ul>	<ul style="list-style-type: none"> <li>Service quality improvement</li> <li>Decrease of nosocomial infection</li> </ul>
How to utilize 5S for the challenges	-	-	Realize human health care by improving the environment	-	-	-
Trigger in starting 5S	<ul style="list-style-type: none"> <li>Tambacounda was designated as a project site by MOH</li> <li>Training in Japan and Sri Lanka by ex. Director</li> </ul>	New director expected to reactivate the 5S activity	<ul style="list-style-type: none"> <li>5S was understood by the health committee</li> <li>The chief showed strong commitment to 5S</li> </ul>	<ul style="list-style-type: none"> <li>Strong commitment of ex.Director</li> <li>Staffs originally had habit to clean the facility.</li> </ul>	<ul style="list-style-type: none"> <li>The chief doctor participated in Internal evaluation workshop</li> <li>An inspection in a hospital in Tamba by her in 2011</li> </ul>	<ul style="list-style-type: none"> <li>A new director from the Thies hospital in June, 2012</li> <li>An introduction of the examples in that hospital</li> </ul>
Start 5S since	2007	2011	2010	2010	2012	The latter part of 2012
Internal obstacles in starting and implementing 5S	<ul style="list-style-type: none"> <li>Lack of human resources</li> <li>Lack of financial resources</li> <li>Difficulty in doctors' participation in 5S</li> </ul>	<ul style="list-style-type: none"> <li>Busy staffs</li> <li>Small budget</li> <li>Strike by nurses</li> <li>Necessity of cost for 5S implementation</li> <li>No time for follow-up by themselves</li> </ul>	<ul style="list-style-type: none"> <li>Maintain the motivation to 5S in busy days</li> <li>Share clearly the policy and contents of 5S with everyone</li> <li>Small number of staffs</li> </ul>	<ul style="list-style-type: none"> <li>Difficulty in mind-set of staffs</li> <li>Prepare regulations and standards</li> <li>The sudden pass-away of a sub-director</li> <li>Spin-out of a chief nurse</li> </ul>	<ul style="list-style-type: none"> <li>Requirement of more 5S or KAIZEN training</li> <li>No fixed budget for 5S activity</li> <li>No transportation to disseminate 5S to other centers</li> </ul>	<ul style="list-style-type: none"> <li>Severe financial situation</li> <li>Lack of human resources</li> <li>Leadership in middle class managers</li> </ul>
External obstacles in starting and implementing 5S	Increase of patients in the Maternity dept.	Transfer in director's position	<ul style="list-style-type: none"> <li>Busy staffs in 24 hours hospital operation</li> <li>This post is in charge of wide area.</li> </ul>	Transfer in the director's position	<ul style="list-style-type: none"> <li>Few supervision by MOH</li> <li>Exodus of the poverty to urban area which causes the increase of patients and unpaid problem</li> </ul>	-
Starting KAIZEN since	-	-	-	-	-	-
Contents of KAIZEN activity	-	-	-	-	-	-
Obstacles in starting and implementing KAIZEN	-	-	-	-	-	-
Volume of introductive training of 5S	Training to each head of department	All the staffs participated in one-day training	<ul style="list-style-type: none"> <li>Training in Tambacounda Health Center</li> <li>Training by JICA</li> </ul>	Training to all the staffs except cleaning and security staffs	3-days training to pilot departments	-
Pilot department of 5S trial	Reception	Maternity, Laboratory, Administration, Dental, and Health education depts.	Post Chief	Maintenance dept.	Administration, Offices of Doctors, managers, and matrons, Warehouse, Ticketing office, Laboratory, and Antenatal consultation office, CPN)	Laboratory, Pharmacy, Cardiology
How to select the pilot dept.	Choose departments with many challenges	-	-	Unnecessary items can be recycled in the department	-	-
Role of the Director in 5S activity	<ul style="list-style-type: none"> <li>Approval of 5S activity</li> <li>Consultation to 5S activity</li> </ul>	Meeting with QIT with their monthly reports	<ul style="list-style-type: none"> <li>Implementation of 5S</li> <li>Discussion with the health committee</li> </ul>	<ul style="list-style-type: none"> <li>Approval to expenditure requests related to 5S</li> </ul>	<ul style="list-style-type: none"> <li>Monthly meeting with the health committee</li> <li>Supervision of 5S at the working areas</li> </ul>	Supervision of 5S as the responsible person of the quality improvement
Role of QIT in 5S activity	<ul style="list-style-type: none"> <li>5S committee</li> <li>Dissemination of good practices</li> <li>Proposals about 5S activity to Director</li> </ul>	<ul style="list-style-type: none"> <li>Monthly supervision of activity in each dept.,</li> <li>Report to the Director</li> </ul>	-	<ul style="list-style-type: none"> <li>5S team</li> <li>Regular meeting in every Friday</li> <li>Monthly report to the 5S committee</li> <li>Supervision of 5S activities</li> </ul>	Supervision at the working areas	<ul style="list-style-type: none"> <li>Encouragement and evaluation of 5S</li> <li>Activity related to "Change2" program</li> </ul>
Short-term output (below 1 year)	<ul style="list-style-type: none"> <li>5S was expanded to all the depts., by 2009.</li> <li>Control the patients by numbering to chairs in the waiting room</li> <li>Used oxygen tanks were separated from new ones.</li> <li>Visual signs (Signalization)</li> <li>Removing potholes in the yard to get better water drain</li> <li>Better safety by collecting used injection needles in a box</li> <li>Change in staffs' mind to solve problems by themselves</li> </ul>	<ul style="list-style-type: none"> <li>Safe activities by staffs</li> <li>Improvement the working condition in the night by installing lights</li> <li>Creation of new space</li> <li>Better hygiene</li> </ul>	<ul style="list-style-type: none"> <li>Understanding and support from local residents and the committee</li> <li>Involvement by all the staffs</li> <li>Better working atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>Analysing situations by staffs themselves</li> <li>Recycle of used materials</li> <li>Share the concept of 5S by posters</li> <li>Income by selling used materials</li> <li>Improvement of filing system</li> <li>Controlling used materials by a database</li> <li>Change in staffs' attitude</li> <li>Decrease of the risk in confusing patients</li> <li>Clean facility</li> </ul>	<ul style="list-style-type: none"> <li>Interviews from media</li> <li>Improvement in working atmosphere</li> <li>Less time for actions</li> <li>recycling of used materials</li> <li>Visual control of medicines</li> <li>Appreciation from patients</li> <li>Increase of patients and the income</li> <li>No trash around the facility</li> <li>ON/OFF label at light switches</li> <li>Spread the 5S activity to other centers</li> </ul>	<ul style="list-style-type: none"> <li>well-ordered shelves</li> <li>Changes in mind and actions of staffs in the laboratory department</li> <li>Improved management of used materials and equipment</li> <li>Improved infrastructure (Pavement)</li> </ul>
Long-term outcome (over 1 year)	<ul style="list-style-type: none"> <li>Sense of responsibility in staffs</li> <li>Fix the file space of emergent patients' information</li> <li>Preparation of the roles of each staff</li> <li>Patient satisfaction</li> <li>Placard of the Charter on patients' right</li> <li>Placard of Vision, Mission and Value</li> <li>Color-coding</li> <li>Positive attitude of staffs</li> <li>Recycling of used materials</li> <li>5S signboard in the yard</li> </ul>	<ul style="list-style-type: none"> <li>Improvement in working atmosphere</li> <li>Patient satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>Standardization of sterilization time and temperature</li> <li>Patient satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>Creation of space</li> <li>Decrease of unnecessary action</li> <li>Effective use of resources</li> <li>Decrease of risks</li> <li>Improved service quality</li> <li>Improvement of working atmosphere</li> </ul>	N/A	N/A
Indicators for hospital evaluation	-	Indicators used by the regional health service	Indicators used by the regional health service	-	-	-
Indicators for 5S evaluation	Indicators used in AAKCP program	Indicators used by PARSS project	-	To be prepared	-	-

## Annex 8. Hospital Management Indicators Specified by the Welfare and Medical Service Agency (WAM)

Management indicators	Description
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Functionalities	1. Bed occupancy rate	Generally, a higher bed occupancy rate implies a higher operating efficiency of the hospital, and results in an increase in medical income. Therefore, this rate is one of the important management indicators.
	2. Inpatient-to-outpatient ratio	This indicator is a significant factor showing the characteristics of the hospital. The ratio varies by a large margin depending on each medical subject and the number of beds. It, however, generally implies that the hospital has a high operating efficiency in comparison with other hospitals of the same type and same scale if the inpatient-to-outpatient ratio of the hospital is higher than that of other hospitals.
	3. Average length of hospital stay	This indicator varies depending on each medical subject. If, however, this length at the hospital is short in comparison with other hospitals of the same type, it implies that the hospital has a higher functionality than other hospitals.
	4. Number of attending staff members per 100 patients	This indicator shows the appropriateness of the number of workers taking care of patients. The figure needs to be evaluated on an occupation-by-occupation basis.
	5. Hospital income per inpatient per day	This value can be considered an indicator of profitability. It rather serves as an indicator to determine the contents of the medical services of the hospital. It is necessary to evaluate this indicator with consideration of relevant factors, such as the nursing level and the number of surgical operations.
	6. Hospital income per outpatient per day	It is necessary to analyze and evaluate this indicator classified by medical treatment type with consideration of the relationship of the indicator with the amount of out-of-hospital prescription, the number of days of medication, and the average number of daily outpatients of the hospital.
	7. Annual medical income per bed	It is necessary to evaluate this indicator with consideration of the bed occupancy rate, number of outpatients, and contents of the medical services, and medical service level of the hospital.

Functionalities: The above items are used to check the indispensable functions and medical service level of the hospital as prerequisites for the quantitative evaluation of the financial and other conditions of the hospital.

Appropriateness of costs	8. Annual salary per hospital staff member	This indicator shows a salary level. Generally, the management of the hospital will be stabilized if this level is low. It, however, should be kept in mind that a low level will adversely influence the motivation of the workers and contents of the medical care and other services of the hospital.
	9. Personnel expense rate	This indicator shows the ratio of the personnel expenses of the hospital to the income. A large number of staff members, their high salary level, and low income of the hospital are considered as factors that raise the personnel expense rate.
	10. Medical materials ratio	This indicator shows the ratio of the medical material costs of the hospital to the income. The ratio is evaluated with consideration of relevant factors, such as the breakdown of drug and medical material costs, medical subjects, medical care functions, and out-of-hospital prescription of the hospital.
	11. Feeding material ratio	This indicator shows the ratio of the feeding material of the hospital to the income. A low ratio has a good influence on the management of the hospital, but it should be kept in mind whether the low ratio is degrading the quality of diet.
	12. Expense rate	This indicator shows the ratio of the expense of the hospital to the income. Generally, a lower rate is considered better, but it is necessary to evaluate the indicator with consideration of the contents of the medical care and other services of the hospital.
	13. Depreciation rate	This indicator shows the ratio of the depreciation expense of the hospital to the income. The amount of depreciation expense will be fixed in the case of straight-line depreciation and will be gradually reduced according to elapsed years in the case of declining-balance depreciation, provided that the income of the hospital is constant.
	14. Ordinary income-to-interest expense ratio	This indicator shows the ratio of the interest expense of the hospital to the income. A lower rate leads to the more stabilized operation of the hospital. The indicator as a financial cost factor is evaluated with consideration of the outstanding borrowings and debt conditions of the hospital.
	15. Break-even point ratio	This indicator shows an income point that branches the profit and loss. It implies that the hospital has higher resistance to a fall in income if this ratio is lower.

Appropriateness of costs: The above items are used to check that necessary expense is spent for high-quality services and that no unnecessary expense is spent.

Productivity	16. Annual medical revenue per attending staff member	This indicator shows the per-capita efficiency of the attending staff members of the hospital. The figure varies depending on the type and scale of the hospital. The figure will increase if a smaller number of workers efficiently handle the same amount of work.
	17. Labor productivity	This indicator shows the amount of added value that each attending staff member has produced. A higher figure implies that the hospital is operating under more efficient and smooth management.
	18. Labor share	The indicator represents the distribution ratio of the added value of the hospital to the labor costs and shows the efficiency of management. The figure is related to the quality and motivation of attending staff members. Therefore, it cannot be said that a lower figure is better.

Productively: The above items are used to check that the personnel and equipment of the hospital are fully utilized and that they are producing appropriate revenue for the hospital.

Stability	19. Equity ratio	This indicator shows the ratio of the equity capital of the hospital to the total capital. A higher equity ratio implies that the financial stability of the hospital is valued higher. There is a tendency that the equity ratio of a hospital increases according to elapsed years.
	20. Fixed long-term conformity rate	It is essential that fixed assets operated over a long period of time are covered by the equity capital and long-term liabilities (e.g., long-term debts) of the hospital. It is necessary that the fixed long-term conformity rate is not in excess of 100%.
	21. Current ratio	This indicator shows the solvency of the hospital to settle current liabilities that require short-term repayment (e.g., accounts payable and short-term borrowings to be cleared off within one year). A higher ratio implies that the short-term financial stability of the hospital is valued higher.
	22. Debt ratio	This indicator shows the relationship between the annual medical income of the hospital as a source of debt repayment and the loan balance of the hospital. A lower ratio implies that the financial stability of the hospital is valued higher.

Stability: The above items are used to check that the short-term solvency and equity capital of the hospital are sufficient to establish a stable financial base.

Profitability	23. Total asset turnover	This indicator shows the efficiency of the capital of the hospital. It is an indicator of the efficiency of capital. If this figure is low, it generally implies that the hospital is in the state of over-investment (i.e., a lack of medical income for the capital investment of the hospital).
	24. Medical income to profit ratio	This indicator shows the ratio of the medical income of the hospital to the profit. Even if this ratio is high, it should be kept in mind to check that the ratio is not degrading the contents of the medical care and other services of the hospital.
	25. Total capital-to-medical income ratio	This indicator shows the ratio of various facility investments of the hospital to the medical profit. A higher ratio implies that the operating results of the facilities are better.

Profitability: The above items are used to check the amount of capital investments to the business and the efficiency of the income from the business.

Sources: Created by referring to a sample of a simple management diagnosis report prepared by the Welfare and Medical Service Agency (WAM), confirmed on May 30, 2013 with the website of WAM.